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CEMA

# **East Germany's Economic Ties to the USSR**

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**A Research Paper**

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*EUR 86-10009  
March 1986*

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# **East Germany's Economic Ties to the USSR**

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**A Research Paper**

This paper was prepared by [ ] Office  
of European Analysis. Comments and queries are  
welcome and may be directed to the Chief, East  
European Division, EURA [ ]

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**East Germany's Economic  
Ties to the USSR**

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**Summary***Information available  
as of 4 March 1986  
was used in this report.*

Soviet leader Gorbachev's calls for improvement in the Soviet economy contain demands for growing support from Eastern Europe. East Germany's comparatively robust economy, sound financial position, large industrial base, and strong scientific and technological capabilities make it the best East European candidate to support Soviet modernization and consumer programs.

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The Soviet Union and East Germany are each other's largest and, in many respects, most important trade partners. Soviet purchases are almost exclusively manufactured goods, with machinery and consumer goods accounting for more than 80 percent of its imports from East Germany. The Soviets import machine tools, ships, computers, optics, agricultural machinery, and mining equipment. They use East German equipment extensively and often praise its high quality and its direct contribution to Soviet industrial productivity. At the same time, the East Germans are increasing deliveries of textiles and clothing, furniture, and pharmaceuticals in support of Moscow's program to upgrade domestic consumption.

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Deliveries of Soviet energy and raw materials are crucial to East Germany's heavily industrial, but resource-poor economy. Even after cuts in Soviet deliveries of some items, the GDR in 1984 received about 73 percent of its oil, two-thirds of its coal, nearly all its natural gas, and all its nuclear fuel from the USSR. The Soviets also supply most of East Germany's cotton, forest products, ferrous metals, and ores. Despite its comparatively strong financial position, East Germany could afford to replace only a small share of these supplies through hard currency purchases in the West.

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Although the advantages of the trade relationship are numerous, both sides also incur costs. The major burden on the USSR is the export of increasingly expensive raw materials and energy that could be used at home or exported to the West for hard currency. The East Germans' major disadvantage is the tight linkage of their industry to the USSR. Soviet customers take, often under long-term contract, the lion's share of output from many industries, squeezing out domestic and Western demand for some of East Germany's highest quality goods. Dependence on the Soviet market also reduces managerial incentives for innovation, quality control, and service that a stronger orientation to Western markets would require.

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The explosion in world oil prices in 1973 set in motion forces that shaped the economic relationship for the next decade. Terms of trade shifted sharply in Moscow's favor, but the USSR chose to reap the new advantage slowly and to give East Berlin several years to adjust by delaying price increases and allowing large East German trade deficits. By the end of the decade, however, Soviet payments problems made the diversion of oil from soft currency markets to hard currency customers appealing; growing domestic requirements for natural resources heightened the pain of chronic Soviet trade surpluses with Eastern Europe. In the early 1980s, Moscow gave substance to earlier warnings to East Berlin by cutting deliveries of several key products, including a 2-million-metric-ton reduction in annual oil shipments. For its part, the Honecker regime helped to redress the imbalance by diverting a larger share of industrial output to the USSR. East Germany's trade with the USSR shifted from a 643-million-ruble deficit in 1982 to near balance through the first three quarters of 1985.

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The net flow of resources will continue to move in the USSR's favor in the new five-year plan period, but apparently at a slower rate than in recent years. The protocol on the coordination of the USSR-GDR domestic economic plans for 1986-90 calls for trade to grow by roughly 3 percent annually over the 1985 level, a marked slowdown from the double-digit rates of recent years. We judge it to be likely that East German exports will grow faster than Soviet exports as East Berlin runs surpluses of perhaps several hundred million rubles per year to repay the deficit of 3.8 billion rubles accumulated over the past decade. The resource cost to East Germany of running these surpluses should be reduced somewhat by the improvement in its terms of trade with the USSR as declining world oil prices are gradually reflected in Soviet prices.

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In response to Moscow's requirements for more consumer goods, better quality machinery, and investment in Soviet energy and natural resource development, East German exports of electrical engineering products, computers, and information technology are scheduled to more than double in value over the next five years. Deliveries of chemicals are to grow by 50 percent, consumer goods by 40 percent, and machine tools by 30 percent. The USSR, in return, has promised to keep the volume of oil exports at the 1985 level and to deliver about 10 percent more natural gas, coal, and iron ore over the period. The Soviets also will increase exports of some manufactured goods.

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The evolution of the economic relationship foreseen in the protocol indicates that the longstanding mutual benefits from bilateral trade will continue, with a moderate shift in the relative supply burden on East Germany. The GDR seems likely to maintain or even increase its economic importance to the USSR, while the Soviets will continue to supply the bulk of energy and raw materials needed by East German industry. Nonetheless, East Berlin will have to devote more of its investment resources and scientific and technological capabilities to meeting the changing needs of the Soviet economy, including a huge appetite for higher quality and more technologically advanced goods.

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Markedly worsening Soviet economic conditions—including lagging growth and hard currency shortages—or changing policies could bring additional claims on East German resources. Should Soviet economic problems so dictate, the USSR might demand larger increases in exports and even higher quality goods from East Germany, or cut back further on deliveries of oil and raw materials. More production problems could push Moscow to use its oil at home, while lower world prices could prompt it to increase the volume of oil exported to the West to maintain earnings; either possibility would ease East Berlin's task of accommodating Soviet wishes, while forcing the GDR to seek supplies elsewhere. Beyond the trade accounts, the Soviets could insist that East Berlin shoulder more of the burden of Warsaw Pact defense spending or ask East Berlin to provide more assistance to Moscow's client states in the Third World.

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A stable, growing bilateral economic relationship will help Moscow achieve its major objective of strengthening the economic and technological base of CEMA and support domestic Soviet needs. It would also help meet

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Moscow's goal of reducing Warsaw Pact vulnerability to Western trade sanctions. A troubled future economic relationship, however, would damage the GDR and the strength of CEMA. East Germany probably could cope with moderate reductions in supplies or increases in export requirements, but major changes would disrupt the East German economy, heighten the risk of political unrest, and ultimately reduce East Germany's value to the USSR. [REDACTED]

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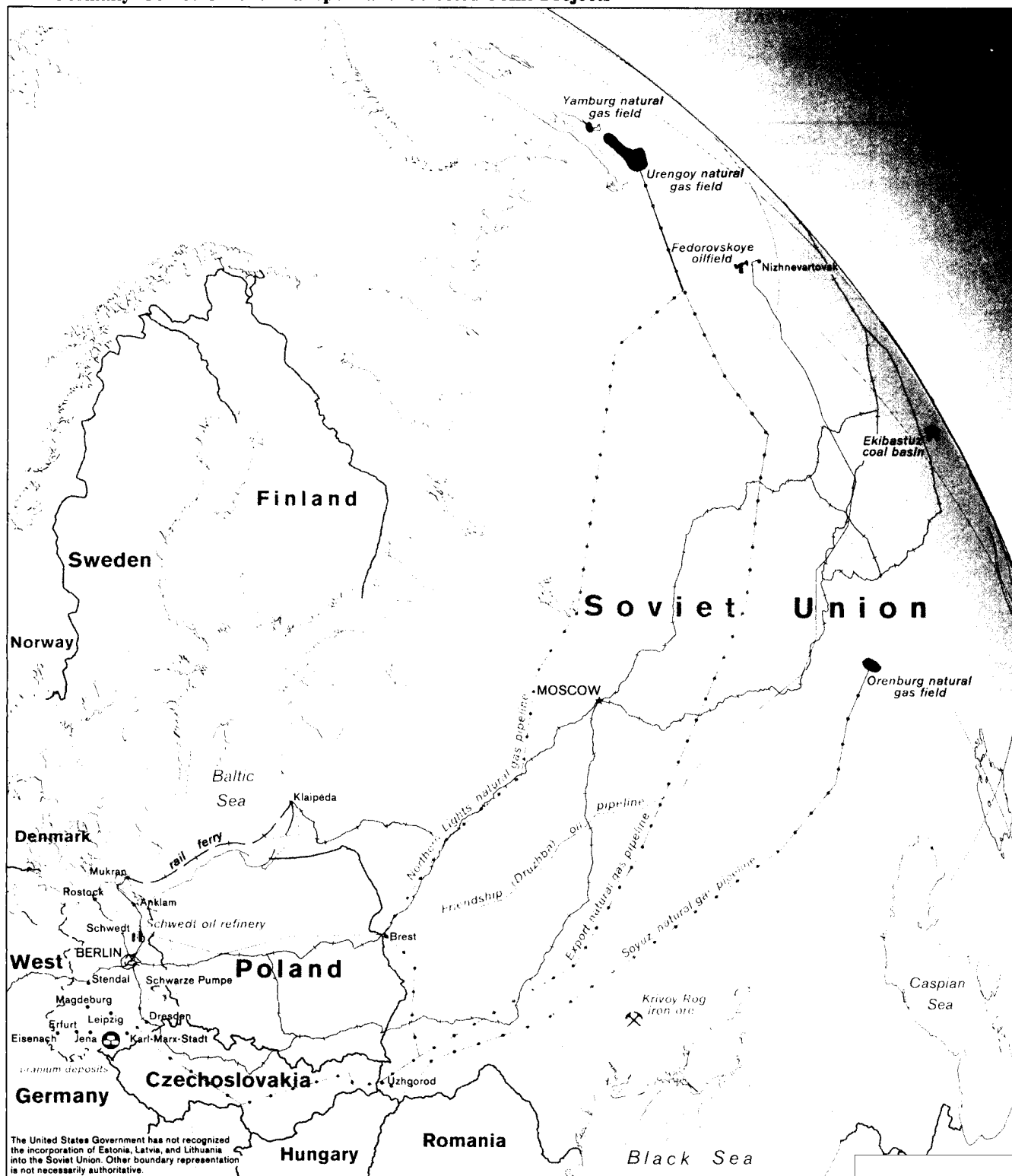
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**Figure 1**  
**East Germany-Soviet Union: Transport and Selected Joint Projects**



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**East Germany's Economic  
Ties to the USSR**

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**Introduction**

East Germany and the USSR have been each other's largest trade partner throughout most of the post-World War II period. The economic relationship is vital to East Germany, which relies heavily on Soviet supplies of energy and raw materials. East Germany, in turn, makes an important contribution to Soviet industry and consumer supplies by delivering manufactured goods that often are of higher quality and more technologically advanced than those provided by other East European countries or produced in the USSR.

This paper examines the content and evolution of economic relations between the USSR and East Germany. The paper begins with a detailed description of the goods exchanged and, where data permit, analyzes the importance of this trade to each economy. The paper then examines the impact of changing economic conditions, Moscow's tougher demands in recent years, and East Berlin's efforts to help satisfy Soviet domestic requirements. In the final section, we consider the outlook for the relationship through 1990 and the prospects for changes in bilateral economic links.

**Foundations of the Relationship:  
History, Mechanisms, and Institutions**

The Soviet occupation of eastern Germany in 1945 forced a sharp reorientation of the economy toward the USSR. Soviet military units seized large quantities of East German plants and equipment and mobilized thousands of German workers for use on Soviet projects. Soviet administrators dismantled factories that had been tied to the economy of western Germany and restructured eastern Germany's industry to complement Soviet industry and to produce items needed to rebuild the USSR. East German statistics show that by 1949, the year the German Democratic

Republic was founded, the Soviet Union was by far East Berlin's largest trade partner, accounting for 38 percent of the GDR's total trade.

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The needs and resource endowments of the two economies facilitated Soviet actions and solidified the economic relationship. The USSR's abundant energy and natural resources and weak industrial development complemented East Germany's poor natural resource base, skilled and disciplined labor force, and well-developed industry. The resulting trade pattern—which has remained largely unchanged for 35 years—has centered on Soviet exports of raw materials in exchange for East German machinery and other manufactured goods (see figure 2).

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There has been a trend—especially since the mid-1970s—toward increasing specialization in the production of industrial goods. East German data show that exports to the USSR of goods produced under specialization agreements represented 49 percent of all exports in 1984, up from 28 percent in 1975 (see table 1). This trade results from agreements under which one party concentrates on production of some items, while the other concentrates on other products in the same sector (see inset). Each side increases output of some goods, presumably benefiting from economies of scale, and cuts back or eliminates other production in which it may be less efficient. East German-Soviet cooperation in the computer industry has become especially close, partly as a result of the Council for Mutual Economic Assistance (CEMA)-wide specialization programs. The two sides exchange mainframe computers—usually under agreements that stipulate exchanges rather than sales—and provide each other with a broad variety of specialized components. In agricultural machinery, the East Germans deliver large quantities of field equipment like combines, while the Soviets provide mostly tractors.

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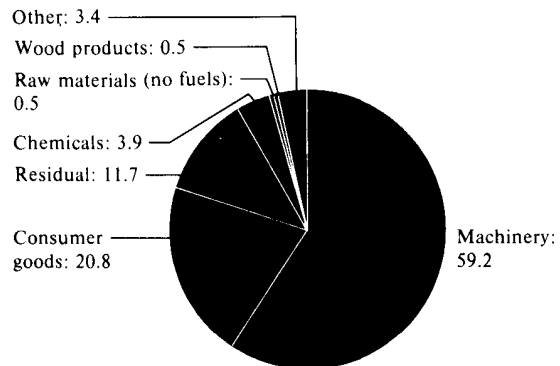
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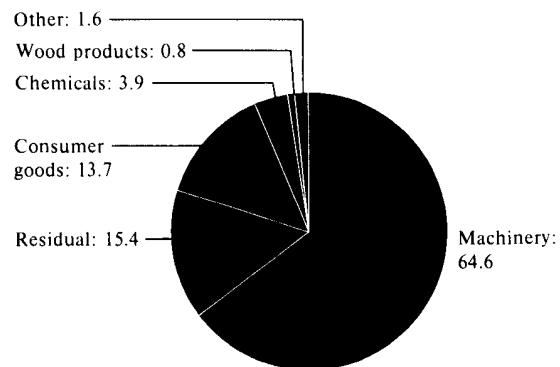
**Figure 2**  
**East Germany: Composition of Trade**  
**With the USSR**

**Percent Exports**

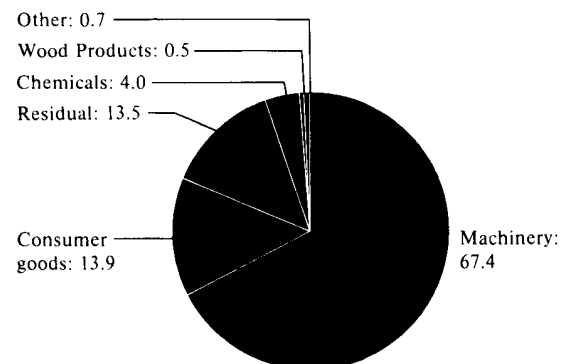
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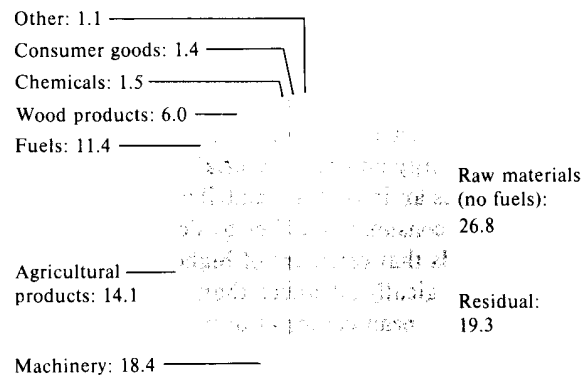
1980



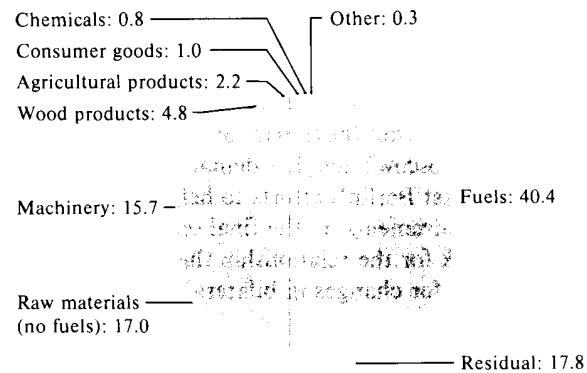
1984

**Imports**

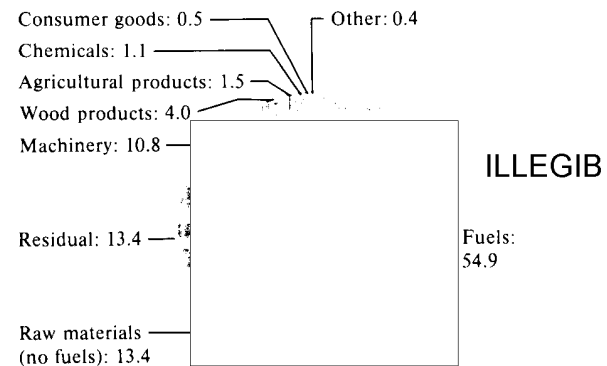
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1984



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**Table 1**  
**East Germany: Share of Exports**  
**to the USSR Produced**  
**Under Specialization Agreements**

Year	Percent
1970	1
1975	28
1979	37
1980	38
1981	42
1982	47
1983	51
1984	49

Source: *Statistisches Jahrbuch der Deutschen Demokratischen Republik* (Statistical Yearbook of the GDR), various years.

**Significance to the USSR**

East Germany is the USSR's leading supplier of machinery and consumer goods, receiving in return a sizable share of Soviet exports of energy and raw material. Soviet statistics show that two-way trade with East Germany amounted to 14.8 billion rubles in 1984, or 10.6 percent of the USSR's foreign trade (see appendix A).<sup>1</sup> By comparison, Soviet trade with Moscow's next two leading trade partners, Czechoslovakia and Poland, were 12.6 billion rubles and 11.4 billion rubles, respectively. Soviet trade turnover with its largest Western trade partner, West Germany, was just over half the East German figure.

The GDR has been particularly helpful in supplying some Soviet industrial sectors and in boosting Soviet technological development (see tables 2, 3, and 4). A few East German products, such as optical equipment, rank among the best in the world. While data

<sup>1</sup> In this paper, we usually use Soviet transferable rubles as the unit of account. See appendix B for ruble/dollar exchange rates.

**The Institutional Framework**

Moscow and East Berlin over the years have signed numerous agreements and established institutions to increase trade, coordinate economic plans and policies, and make the economic relationship more responsive to their mutual needs. The general guidelines for trade are set forth in five-year bilateral trade protocols, which are integrated into the five-year economic plans of both countries. The protocols provide a framework for the conclusion of annual trade plans, which in turn are implemented by contracts between economic entities from each country.

Soviet-East German efforts to specialize in the production of manufactured goods often proceed under the auspices of the Council for Mutual Economic Assistance (CEMA), but the most important and binding agreements are negotiated and implemented bilaterally. A prominent recent example is the pact signed in October 1984 by Soviet Foreign Minister Gromyko and East German leader Honecker on cooperation in science and technology through the year 2000, replacing a 1979 agreement intended to cover the period through 1990. Individual ministries often sign agreements for cooperation, specialization, or joint ventures in their sectors of responsibility. The East Germans in December 1985 put the number of pacts at the governmental or ministerial levels at 255, mostly in scientific and technical areas.

Economic issues are often prominent on the agendas of meetings between Soviet and East German leaders, and even relatively minor issues sometimes are settled by the party leaders. The Joint GDR-USSR Government Commission for Economic and Scientific-Technological Cooperation, headed by deputy chairmen of each country's Council of Ministers, oversees the work of organizations responsible for the economic relationship.

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**Table 2**  
**USSR: East Germany's Share of Imports**  
**by Commodity Group, 1984**

Product	Percent
<b>Total</b>	<b>11.28</b>
Machinery and equipment	20.75
Of which:	
Chemical, paper, construction equipment	16.09
Metal-processing equipment	31.18
Power and electrical engineering	16.31
Mining, metallurgy, petroleum	12.20
Material handling	15.82
Electric power and radio measuring instruments	24.35
Agricultural machinery	43.94
Railroad rolling stock	35.33
Vessels	27.92
Petroleum refining equipment	42.03
Food and light industry equipment	21.09
Raw materials	
Fuels	
Ferrous metals	
Nonferrous metals	
Chemical products	11.10
Of which:	
Chemicals	10.18
Plastics	15.66
Pesticides	9.58
Dyes	13.88
Wood and wood products	4.91
Of which:	
Paper	13.00
Agricultural products	
Consumer goods	13.57
Of which:	
Fabrics	12.32
Clothing and linens	10.52
Haberdashery goods	20.73
Household goods	25.75
Furniture	26.88
Pharmaceuticals	12.95
<b>Residual</b>	<b>17.58</b>

Source: Official Soviet foreign trade statistics.

are reasonably complete on the value of individual goods traded, other information gaps and methodological problems prevent a full analysis of the impact of trade on the respective economies. This is particularly true in measuring the importance of individual East German goods to the Soviet economy because the GDR's exports usually account for only a small share of inputs used in individual sectors (see inset).

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**Machinery**

The USSR buys large amounts of East German equipment for a broad variety of industries. Machinery worth 5 billion rubles comprised two-thirds of Soviet imports from the GDR in 1984 and one-fifth of Soviet machinery imports from all sources. Although knowledgeable Western observers typically rate East German equipment several years behind the West, the Soviets use East German machinery extensively because it often is better than Soviet products, helps reduce shortages, and saves Moscow hard currency. It also can be tailored to specific Soviet requirements and can improve productivity. A recent Soviet article, for example, praised an East German contribution to the Moscow Automobile Plant. A new East German production line will make 5,000 parts per shift with only one worker, replacing a line that produced 1,500 parts per shift with 12 workers. Tighter COCOM restrictions on exports of Western technology in recent years, in our view, have made East German equipment even more appealing as a substitute for Western products.

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**Machine Tools.** Exports of machine tools are probably East Germany's most valuable contribution to Soviet industry. According to Soviet statistics, deliveries to the USSR of metalworking machine tools rose sharply in 1981-84, reaching 550 million rubles. Soviet statistics for 1984 indicate that East German metalworking equipment accounted for 31 percent of all Soviet imports of such goods. The Soviets buy large quantities of conventional and specialized metal cutting tools, stamps, and presses for use in a variety

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**Table 3**  
**USSR-East Germany: Value of Trade**  
**by Commodity Group, 1984**

Million rubles

	East German Exports	Soviet Exports		East German Exports	Soviet Exports
<b>Total</b>	<b>7,367.2</b>	<b>7,481.4</b>	Construction materials	20.4	20.5
Machinery and equipment <sup>a</sup>	4,962.4	809.7	Other nonfood raw materials	40.0	411.4
Raw materials		5,109.6	Of which:		
Of which:			Lumber and wood products		296.8
Ores, ore concentrates, materials		34.9	Grain		5.6
Fuels		4,110.0	Textile fibers		108.6
Of which:			Food		6.5
Petroleum		3,124.8	Other industrial materials	27.7	
Natural gas		721.9	Consumer goods	1,026.9	36.7
Coal and coke <sup>b</sup>		213.9	Of which:		
Electricity		49.5	Household goods	152.5	9.8
Ferrous metals		898.8	Textiles	241.2	
Of which: <sup>c</sup>			Furniture	147.8	
Rolled ferrous metals		718.0	Pharmaceuticals	261.8	7.5
Pig iron		68.9	Haberdashery goods	63.7	
Nonferrous metals			Residual <sup>d</sup>	997.2	1,003.4
Chemical products	292.6	83.6			
Of which:					
Chemicals	151.0	72.7			
Plastics	74.4	10.2			
Fertilizer/pesticides	37.5				

<sup>a</sup> Table 4 provides detailed data on the machinery trade.

<sup>b</sup> Much of this "Soviet" coal actually is mined in Poland but is recorded as a Soviet product under a longstanding trilateral trade agreement.

<sup>c</sup> Anecdotal evidence indicates that the GDR delivers steel pipes, but they do not show up in Soviet or East German statistics.

<sup>d</sup> The residual entry apparently primarily includes sales of military hardware and sensitive goods not included elsewhere.

Source: *Vneshnyaya Torgovlya SSSR* (USSR Foreign Trade) 1984.

[Redacted]

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of industries, including plastic injection molding, bearing production, and automobile and agricultural equipment manufacturing. One East German official reports that, over the past 30 years, the Soviet Union has purchased over 150,000 machine tools from the GDR. [Redacted]

According to Western and East European experts, East German machine tools lag comparable Western machinery in quality and efficiency. Among East European nations, however, East Germany appears preeminent in the technologies for specialized machine tools—ones adapted for specific manufacturing 25X1

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**Table 4**  
**USSR: Imports of Machinery From**  
**East Germany, 1984**

Item	Quantity (units)	Value (million rubles)	Item	Quantity (units)	Value (million rubles)
<b>Machinery and equipment, total</b>		<b>4,962.4</b>	Road and roadbuilding machines		82.9
Metalworking equipment		549.6	Pump and compressor equipment		67.7
Metal-cutting machine tools		454.2	Of which:		
Metal-processing equipment		95.3	Compressors	7,830	19.4
Power and electrical engineering equipment		284.6	Pumps	1,000	30.2
Of which:			Printing industry equipment		61.6
Power engineering equipment		129.2	Typewriters	105,524	39.9
Electrical engineering equipment		95.0	Bookkeeping machines	1,715	33.6
Cables and wires		60.4	Instruments, laboratory, medical equipment		209.4
Mining, metallurgical, and petroleum equipment		297.0	Of which:		
Equipment for surface mineral extraction		81.9	Electric power and radio measuring instruments		145.9
Crushing, grinding, and dressing equipment		40.5	Medical equipment (excluding pharmaceutical)		60.6
Metallurgical equipment		144.5	Agricultural machinery and equipment		523.8
Petroleum refining equipment		30.2	Of which:		
Material handling equipment		210.3	Combines	6,573	133.5
Food and light industry equipment		387.2	Mowers	4,585	70.8
Of which:			Grain-cleaning machines	3,688	33.9
Food industry equipment		208.1	Motors for agricultural equipment		267.8
Refrigeration equipment		67.4	Transportation equipment		958.9
Textile industry equipment		95.6	Railroad rolling stock		380.8
Chemical, paper, construction, and other equipment		631.8	Trailers	5,853	17.4
Of which:			Ships		560.7
Chemical industry equipment		189.3	Residual		909.7
Equipment for construction materials industry		53.4			

Source: *Vneshnyaya Torgovlya SSSR* (USSR Foreign Trade), 1984.

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**Data: Sources and Gaps**

*Analysis of the Soviet-East German economic relationship is complicated by data problems that limit our ability to measure the impact of trade on individual sectors of these economies. Most of the trade data in this paper are from annual issues of Vneshnyaya Torgovlya SSSR (USSR Foreign Trade) because Soviet statistics provide the most complete commodity breakdown, by value of exports and imports traded. The main East German source—Statistisches Jahrbuch der Deutschen Demokratischen Republik (Statistical Yearbook of the German Democratic Republic)—since 1974 has reported only total trade (not disaggregated into exports and imports) with individual countries. It does, however, report exports and imports of a few commodities by partner country, and these data in some cases fill gaps in Soviet statistics. The East Germans, for example, provide data on the volume of crude oil imported from the USSR; Moscow has published only value data on oil trade since 1976.*

*The available data provide the amounts of physical deliveries for only a few commodities, leaving major gaps in our knowledge of levels and changes in real (price-adjusted) flows of goods. The problem is most serious in estimating East German deliveries, which are largely heterogeneous manufactured goods for which we do not have price data. Even when the number of units of a particular item is reported, the figure is often nearly meaningless because trade categories generally encompass a wide range of products whose technical characteristics change over time. We can better gauge the volume of Soviet shipments*

*because the Soviets report some quantities of key commodities; in other cases, price information allows estimation of physical quantities from published value data.*

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*We present the trade data in foreign trade rubles, the unit of account in which Moscow denominates and reports its trade. The exchange rate between the foreign trade ruble and the dollar fluctuates in line with the strength of the dollar against major convertible currencies. The Soviet Foreign Trade Bank issues an official ruble-dollar exchange rate twice a month. In recent years the average annual "value" of the ruble has ranged from a high of 0.649 per US dollar in 1980 to a low of 0.816 per dollar in 1984 (see appendix B).*

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*Both countries report very little in regular statistical series on how or where imported goods are used in their economies. This is particularly troublesome for analysis of Soviet imports because of the large size of the Soviet economy, the relatively small size of imports from the GDR in comparison to total imports plus domestic production, and the heterogeneous nature of those imports. We can better gauge the impact of large imports of Soviet raw materials on the smaller East German economy.*

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*Finally, neither side publishes debt or capital flow statistics, which hinders our ability to address the key questions of how much the East Germans owe the USSR (see appendix C).*

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purposes. In 1982, the East Germans accounted for the largest portion by far (roughly 29 percent) of CEMA trade in specialized machine tools.

Since the early 1970s, specialized, automated, and semiautomated machine tools as well as automated machining lines have accounted for an increasing share of East German exports of metalworking equipment to the Soviet Union. The portion of standard

machine tools in the GDR's exports to the USSR decreased from 75 percent in 1957 to 30 percent in 1985. During the same period, automated machine tools, including those with numerical controls (NC machine tools), grew from 20 percent to at least an estimated 50 percent of machine tool exports.

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The East German deliveries are important to the USSR because the Soviet machine tool industry is plagued by obsolescence, inefficiency, and poor quality. [ ] the share of obsolete equipment (designs at least 10 years old) in the production of 11 machine-building ministries rose from 16 percent in 1967 to more than 30 percent in 1981. A recent Soviet article reports that only 60 percent of requirements for machine tools with digital program control are being met. Serial production of NC machine tools in the USSR did not begin until 1972, and the Soviets still lag in the production of advanced equipment such as machining centers and computer-aided numerically controlled (CNC) machine tools. [ ]

The GDR also is cooperating with the USSR in the development of flexible manufacturing systems (FMS)—computer-controlled manufacturing lines. A source reports that the Soviets were to take delivery of the first East German FMS in 1985 for installation in factories in Minsk and Gorky. By 1990, according to an East German industrial minister, the GDR plans to supply the Soviets with nine complete FMS and 130 sections of such systems. The Soviets, however, import most of their FMS from Western countries. [ ]

**Advanced Technology.** In addition to advanced machine tools, East Germany exports significant quantities of high-technology items such as computers, microelectronics products, robots, lasers, and optical equipment to the USSR. While small in comparison with Soviet production, the East German deliveries are generally superior in quality; some—notably lasers and optics—even approach Western standards. The Soviets use much of this equipment in military applications as well as in scientific research and industry. [ ]

The GDR's major contribution in computers and related products is the ES-1055 series mainframe computer produced by the Robotron combine (see table 5). Like much of East German production, it is based on an IBM model. The medium-capacity ES-1055 series is the only CEMA computer of its size [ ]

[ ] during the past decade the Soviets obtained 50 to 80 units annually, but this represents a small contribution to the Soviets' computer stock. In 1984, the USSR contracted for 76 units as part of a computer swap deal worth 268 million rubles, according to Soviet press reports. The Soviets, according to the press, have purchased over half of Robotron's production of medium-capacity computers to date. The Soviets also buy smaller East German computers and peripherals as well as microcomputers, office calculators, personal calculators, and magnetic tape strips and tapes. [ ]

[ ] According to press reports, the Baltic Maritime Shipping Agency has at least one in Leningrad for controlling its fleet, and the Soviets use East German data-processing equipment in space research, the oil refining industry, and at the Dubna nuclear research center. [ ]

The GDR is a major East European supplier of microelectronics components to the USSR, mainly for defense industries. We estimate that the Soviets receive 50 to 70 percent of East Germany's output, although these imports cover only a small percentage of Soviet consumption. Under the terms of a long-term government-to-government agreement signed in 1982 and previous agreements, the two countries collaborate extensively in research and development and exchange growing quantities of products. We judge the East Germans' strengths to be in design and quality control, although their products typically lag state-of-the-art Western electronic products by several years. [ ]

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**Table 5**  
**East Germany: Selected Industrial Combines**  
**With Significant Sales to the USSR <sup>a</sup>**

Firm	Headquarters	Employees <sup>b</sup>	Main Products	Comments
VEB Schwermaschinenbau-Kombinat "Ernst Thaelmann"	Magdeburg	28,000	Heavy machinery	Provides a variety of goods to the USSR and is building cranes for new-generation Soviet nuclear power stations.
VEB Schwermaschinenbau-Kombinat TAKRAF	Leipzig	40,000	Heavy machinery, cranes, mining equipment	Soviets in 1985 bought 700 slue (railroad) cranes from subordinate enterprise—over half its output through 1990. Firm agreed to 372-million-ruble deal for 1986-88 at Spring 1985 Leipzig Fair.
VEB Werkzeugmaschinen-Kombinat "Fritz Heckert"	Karl-Marx-Stadt	25,000	Machine tools, presses	Manufactures some of the GDR's most advanced machine tools, including numerically controlled machine tools.
VEB Kombinat Umformtechnik "Herbert Warnke"	Erfurt	19,000	Machine tools, presses, plastic forming equipment	Combine also has a metalworking specialization role within CEMA. Seventy-five percent of its output in 1984 went to the USSR, according to press reports.
VEB Kombinat Polygraph "Werner Lamberz"	Leipzig	15,000	Printing presses, bookbinding	Firm's products apparently used widely in USSR. Quality is good and some products are exported to the West, including to the United States.
Kombinat VEB Carl Zeiss Jena	Jena	58,000 <sup>c</sup>	Optics, cameras, precision measuring devices, lasers, micro-electronic components, scales; electronic components such as magnetic tape measures	Firm was completely destroyed in the late 1940s by Soviet occupation forces. Employees who did not flee to West Germany rebuilt the combine into the world leader in some technologies, particularly lasers. R&D facility employs 7,500, of whom 2,500 are technicians.
VEB Kombinat Robotron	Dresden	70,000	Computers, calculators, office equipment	Robotron apparently exports more to the USSR in value terms than any other East German combine.
VEB Mansfield-Kombinat "Wilhelm Pieck"	Eisenleben	46,000	Nonferrous metal refining and fabrication	Mansfield has been made "prime contractor" for East German contribution to development of Krivoy Rog iron ore deposit.
VEB Kombinat Fortschritt Landmaschinenbau	Eisenach	64,500	Agricultural equipment, including tractors, plows, harvesters, and milling machines	In 1984, the firm diverted to the USSR about 20 percent of the potato harvesters already purchased by the GDR Ministry of Agriculture.

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**Table 5**  
**East Germany: Selected Industrial Combines With Significant**  
**Sales to the USSR <sup>a</sup> (continued)**

Firm	Headquarters	Employees <sup>b</sup>	Main Products	Comments
Kombinat VEB Mikroelektronik	Erfurt	48,000	Microelectronics, integrated circuits, industrial robotics	Makes microelectronic components in great demand by Soviet customers. Supplies Robotron and Carl Zeiss Jena. Is major importer of legally and illegally acquired Western microelectronic parts.
Kombinat Schiffbau	Rostock	57,000 <sup>d</sup>	Ships, fishing boats, dredges, inland water craft	Combine operates all six civilian shipyards. Most of output in recent years has gone to Soviet customers; building the six rail ferries for the new Mukran (GDR)-Kleipeda (USSR) link.
VEB Kombinat Seeverkehr und Hafenwirtschaft-Deutfracht/seereederei	Leipzig	NA	Ocean shipping	Firm presumably will operate the Mukran-Kleipeda ferries.
VEB Kombinat TEXTIMA	Karl-Marx-Stadt	33,000	Textile manufacturing equipment	The Soviets buy large quantities of machines for their natural and synthetic textile industries.

<sup>a</sup> East German industry is organized into *Kombinate*, or combines, which typically are vertically integrated monopolies, or near monopolies, comprised of 20 to 40 "people-owned enterprises" (*Volks-eigener Betriebe*, or VEBs). Many have subordinate foreign trade enterprises.

<sup>b</sup> Data as of 1979 unless otherwise noted.

<sup>c</sup> As of 1985.

<sup>d</sup> As of 1984.

Sources: *Verzeichnis der Kombinate der DDR, Bonn, 1980*, East German press, CIA estimate.

Soviet institutes such as the Scientific Research Institute of Semiconductor Electronics in Moscow appear to be incorporating East German microelectronics technology into their research and development efforts (see inset). An important GDR contribution is production of 8- and 16-bit microprocessors based on the Z-80 and Z-8000 models of the US firm Zilog; the Soviets apparently are having problems producing similar microprocessors based on the US Intel Corporation designs. The 8-bit microprocessor is used in guidance systems for aircraft and missiles and in radars. [ ]

We believe East Germany produces the best integrated circuit (IC) manufacturing equipment in CEMA and is selling some to the USSR. East German

equipment for manufacturing ICs appears to be of better quality than East German ICs themselves. The Soviets use these machines to make their own microelectronic components. [ ]

The East Germans are combining their electronics and machine-building skills to manufacture robots, including so-called industrial robots, for sale to the Soviets. Many of these are not robots by Western criteria but rather are less sophisticated automated manipulators. The machines, nevertheless, contribute substantially to improvements in productivity in both

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**Technology Transfer**

*The Soviet Union receives technology from East Germany in several ways. Some technologically advanced Western goods acquired by East Germany both legally and in circumvention of COCOM restrictions are shipped directly to the USSR.*

*Despite the high level of intra-German trade, we have little evidence that a large flow of restricted goods enters directly from West Germany. We believe that the East German Ministry for State Security (MfS), foreign trade enterprises associated with high-tech industrial combines, and the trading house Intrac Handelsgesellschaft are particularly involved in the technology acquisition effort.*

*East German industrial sectors deliver to Soviet customers technology—both home developed and imported—embodied in their products.*

*East German industrial combines, many of which have classified research departments, provide some "homegrown" technology that is superior to that of the USSR. In some cases, Soviet acquisition of GDR technology stems from CEMA specialization agreements.*

*The two countries also collaborate in basic research. A 1985 agreement by the respective Academies of Science furthers the cooperation. Completion of a data link between the two scientific communities in October 1984 facilitates the exchange of information.*

economies. Even if only a small percentage of these are multiaxis programmable robots—machines that can be reprogramed by their operators—they represent an important contribution to the Soviet development of advanced manufacturing practices. Recent agreements, including the one on bilateral cooperation through the year 2000, have highlighted further cooperation in the robotics field; both countries are counting on the efficiency generated by automation to be a major source of future economic growth.

Optics is one of the GDR's most advanced industries, and East Germany exports high-quality optics to Soviet customers. The Carl Zeiss Jena (CZJ) combine—the GDR's main optics producer—has an international reputation for technological development and product quality, and its products are sold extensively in the West. The Soviets purchase microscopes, telescopes, cameras, film, precision measuring devices, cartographic equipment, and stereoscopes.

The Soviets employ East German optics in photoreconnaissance cameras, Earth survey equipment aboard Soyuz and Salyut spacecraft, and Venus planetary probes.

The East Germans supplied some 150 pieces of equipment, according to the East German press

The Soviets may take up to 75 percent of East German production of image processing systems.

East German laser development, the quality of which a Western physicist rates as "very high," has contributed significantly to the Soviet program. The East Germans have developed glass rods that increase the efficiency of Soviet high-powered lasers by a factor of two and a half.

The joint laser effort, which involves close relations between CZJ and leading Soviet optics research and production facilities, includes weapons development (see inset). East Germans provide laser rangefinders used in Warsaw Pact military equipment. The East Germans also have developed lasers used to blind enemy sensors. The GDR produces other military-related optics products, such

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**Military Production**

*The direct contribution of East German industry to Soviet and Warsaw Pact military weaponry is small. The East Germans produce rifles, ammunition, and trucks for their own Army, and supply support equipment like radios and chemical protection gear to their allies, but they do not produce major weapons for Warsaw Pact ground forces. Poland and Czechoslovakia, by comparison, produce T-72 tanks and other armored vehicles for non-Soviet Warsaw Pact forces, and military aircraft for the Soviets. The East Germans' largest contribution to the Warsaw Pact is the production of coastal warships—armed largely with Soviet weapons—which they use themselves. Military observers generally rate the fleet as a credible force in the Baltic, and it has become more important given the decline in Polish naval construction in recent years.* [redacted]

*East Germany's contribution of components to defense industry production is greater, though difficult to quantify. We believe the GDR's most important deliveries are high-tech items such as microelectronics, computers, night vision devices, laser range-finders, and optics. Although many of these products have civilian applications, they almost certainly are used widely to improve Soviet defense industrial capabilities.* [redacted]

*The small size of East Germany's military-industrial complex has its origins in World War II, when the Allies agreed that defeated Germany would be disarmed. The Soviets confiscated or destroyed essentially all of eastern Germany's military production capacity and did not permit establishment of the East German National People's Army until 1956. Perhaps because the Soviets are still wary of establishing significant defense industries in a German state, the East Germans receive essentially all of their heavy weapons from their allies' factories—including the Soviet Union—and produce none for the USSR.* [redacted]

**Table 6**  
**East Germany: Ship Production and Deliveries**

	Production	Total Exports	Exports to USSR
1980	61	54	40
1981	59	58	41
1982	58	53	41
1983	67	63	53
1984	75	72	57
1985 <sup>a</sup>	75	75	75

<sup>a</sup> Plan.

Sources: Official East German statistics, the East German press, US Navy estimates.

[redacted]

as binoculars, infrared cameras and sensors, and night vision devices. Some of this equipment undoubtedly is used by the Soviet military.

**Transportation Equipment and Agricultural Machinery.** East Germany is the USSR's largest foreign supplier of transportation equipment and agricultural machinery. In 1984, East German deliveries accounted for 28 percent of the value of Soviet imports of ships, 35 percent of railroad equipment, and 44 percent of agricultural machinery. Because of specialization agreements and large Soviet orders, the GDR has geared its production to the Soviet market, which absorbs well over half of East German production in these sectors.

East German shipyards turn out medium-size dry goods and bulk carriers, roll-on/roll-off (Ro/Ro) vessels, and river passenger ships, many designed exclusively for Soviet customers. Delivery of 53 vessels in 1983 (worth 510 million rubles) made the GDR the USSR's largest foreign supplier of ships in number; only Finland delivered a higher tonnage (see table 6). Moreover, ships received from East Germany equaled 57 percent of the number of commercial ships built in Soviet yards in 1983.

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**The Mukran-Kleipeda Ferry Project**

*The largest joint transportation project between the USSR and the GDR involves the linkage by rail ferries of ports at Mukran, on Ruegen Island, and Kleipeda, Lithuania (see map). Begun in 1983, the project involves the construction of piers, rail yards, and support structures by each side. The East Germans will build facilities at Mukran to change railcars between the wide Soviet and the narrower European gauges. They also are building six 185-meter-long, 11,700 deadweight-ton ferries that will carry up to 103 railcars or wheeled and tracked vehicles on two decks; three of the vessels will belong to the USSR. Introduction of service with the first of the ships—which are modeled after vessels now in operation between Ilyitschovsk in the Crimea and the Bulgarian port of Varna—is scheduled for October 1986. (Under construction in October 1984, the ship was launched in December 1985 and sea trials will begin in April 1986.) When the last ferry is delivered in 1990, the East Germans expect the new service to carry 5.3 million tons of cargo annually, including 3 million tons of East German imports. (For comparison, total bilateral seaborne transport was scheduled to be 8.5 million tons in 1985.)*

*The project is experiencing some problems—such as intermittent parts shortages—but it has received priority in resource allocation and appears to be approximately on schedule. We do not know the total cost of the project, but the East Germans in 1985*

*estimated the cost of the Mukran terminal alone at nearly 550 million rubles.*

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*The link will provide both sides with significant economic benefits:*

- *It will cut transport costs by about 80 percent, and reduce transit fees to Poland substantially. The GDR, we believe, now pays most of these costs.*
- *Ferries will be able to make round trips in 48 hours, cutting delivery times at least by half.*
- *The ships will reduce vulnerability to chronic bottlenecks in the East European, particularly Polish, rail networks.*
- *Sea freight is less vulnerable to instability in Poland than land transportation—a particularly great concern in 1981-82 when the project was initiated.*

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*The project has security implications, explaining East Berlin's designation of the venture as a "national defense" effort.*

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*The Soviets will be able to improve delivery of military materiel and troops to the GDR both in peacetime and in the event of war.*

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The Soviets use East German ships built extensively in their merchant marine and fishing fleets. According to the East German press, deliveries to the USSR in 1983 included:

- The first vessel of the Astrakhan-series 18,020 deadweight-ton (DWT) multipurpose "Lo/Ro" freighter featuring combined Ro/Ro and conventional cargo handling.
- Three 16,030 DWT container ships and three 19,252 DWT special bulk carriers.
- Two Kristall-II-class fish refrigeration and transport vessels, six Atlantik-class supertrawlers, and 24 freezer-trawler-seiner vessels.
- Support craft including refrigerator vessels, inland passenger ships, coastal and inland waterway motorships, and dredges.

The Soviets bought 57 vessels in 1984 as well as marine diesel engines and related equipment. Some 50 ships slated for delivery to the USSR were under construction in January 1985, including the first of six railroad ferries to be used to improve bilateral seaborne transport (see inset). Seventy-five vessels were scheduled for delivery in 1985. August 1985, the Soviets ordered 16 more Astrakhan-class ships, which they have been using on routes to Third World ports and for arms shipments. In total, according to the press, the GDR has delivered over 3,300 vessels of all types.

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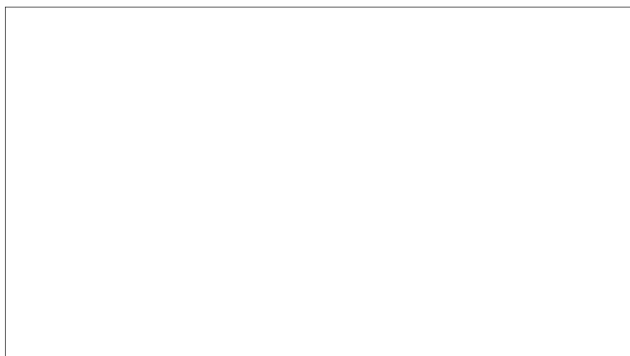
The East Germans provided railroad equipment, including freight cars and passenger coaches valued at 381 million rubles in 1984. A December 1984 pact extended a logstanding rail equipment agreement through 1990 and called for increased cooperation in production of passenger coaches. The Soviets do not purchase East German autos and buy only small quantities of trucks and trailers. The GDR does not manufacture commercial or military aircraft. [REDACTED]

Soviet imports of agricultural machinery from the GDR surged 31 percent in 1983, and another 14 percent in 1984, to 524 million rubles. The basis of exchange in recent years has been a 1980 ministerial agreement on specialization in agricultural machinery production. A follow-on ministerial agreement to extend until 1990 was signed at the Leipzig Fair in September 1984. In an implementing contract signed in March 1985, the Soviet foreign trade organization Tractorexport and the East German firm Fortschritt agreed to exchange another 315-million-rubles worth of agriculture-related machinery. This deal calls for the Soviets to receive mowers and field choppers as well as fertilizer technology and seed preparation plants in exchange mostly for tractors, combines, and farm implements. [REDACTED]

**Equipment for Energy Production, Industrial Processes.** The GDR provides a comparatively small amount of energy production equipment to the USSR. The largest item as a share of foreign supplies is petroleum-refining equipment; East Germany delivered just over 42 percent of Soviet imports in 1984. Advanced, high-capacity mining equipment—primarily for coal and lignite strip mining—is probably an even more important East German contribution to production. East German equipment is used in the large Kuzbass and Ekibastuz coalfields and will help develop the Kansk-Achinsk deposits in Siberia. The Soviets report that East German machines mine about 100 million tons of coal annually, or about one-third of surface-mined production and one-sixth of total output in the USSR. The Soviets also purchase East German drilling equipment, pipe, gas compressors, and gas transmission equipment. [REDACTED]

The two sides have concluded agreements to develop more efficient chemical processes, exchange chemical equipment, research new products, and collaborate on water purification and sewage treatment processes. Under these agreements, the GDR provides equipment (worth 189 million rubles in 1984) and assists in plant construction. The two sides have collaborated on polyethylene production and since 1969 on polyurethane. A ministerial agreement on fiber production was signed in June 1984. [REDACTED]

The Soviet Union also has acquired metal refining equipment (worth 144 million rubles in 1984) as well as East German assistance in development of equipment for alloy production and electron beam smelting.



East Germany supplied 21 percent of Soviet machinery imports to equip light industrial plants in 1984, and the amount of deliveries seems likely to increase significantly in the future. Under an August 1984 agreement, the GDR Ministry for Light Industry will help modernize 19 Soviet enterprises in the textile, clothing, and shoe industries. Perhaps the leading area for growth will be agricultural and food-processing items to support the USSR's Food Program. Announced in May 1982, this program is designed to improve the Soviet diet by increasing food output and boosting the efficiency of agriculture and food processing. Agreements on the books in 1984 called for USSR-GDR cooperation in more than 500 specific projects, including the bakery, dairy, confectionary, and beverage industries. Soviet-East German agreements also call for the construction and modernization through 1990 of agricultural cold storage facilities, development of other storage processes, and development of refrigerated railroad cars. The first East German refrigerator units were delivered in February 1984. [REDACTED]

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**Other Areas**

Apart from machinery deliveries, East German exports to the USSR include consumer products, food, and some intermediate goods. The GDR also provides a large quantity of goods reported only as an unexplained residual. [ ]

East German deliveries of industrial consumer goods amounted to 1 billion rubles in 1984, up 68 percent over 1980. Many of the purchases come under cooperation agreements intended to foster improvements in quality and expansion of product variety. The increase is similar to the trend for other East European countries and reflects Moscow's effort to have CEMA countries make a larger contribution to improving consumer supply in the USSR. Soviet statistics indicate that in 1984 the USSR imported from East Germany finished clothing, cotton and woolen textiles, toys, haberdashery items, furniture, and pharmaceuticals and personal care products. East Germany is particularly important in supplying furniture, accounting for 27 percent of Soviet imports in 1984. [ ]

East Germany has begun providing some food, although neither country's official statistics show the flow. In the fall of 1985 the GDR delivered on an emergency basis about 250,000 tons of potatoes—apparently to ease local shortages in the northwestern USSR—with the help of nearly 20,000 Soviet soldiers. Another shipment of over 210,000 tons is scheduled for delivery in April 1986. Together, these sales would cost some \$50 million if purchased at current US prices. In May 1984 over 38,000 tons of pork were awaiting delivery to the USSR at the East German port of Wismar. [ ]

The East Germans use some of the oil and gas obtained from the USSR and their own lignite as feedstocks for chemicals exported to the USSR. Chemical product sales totaled 293 million rubles in 1984, according to Soviet statistics; plastics accounted for about one-quarter and dyes about 20 percent of sales. Although chemical purchases from the GDR

account for only a small part of overall Soviet chemical needs, the GDR is the USSR's largest foreign supplier of pesticides, with 22,846 metric tons delivered in 1984, according to Soviet statistics. [ ]

The two sides collaborate on development of construction technologies and construction materials, and East Germany exports modest quantities of insulation. The respective Ministries of Construction in October 1984 signed an agreement to improve construction of housing and public buildings and increase mechanization during 1986-90. [ ]

The Soviets import one of East Germany's few natural resources—uranium—which East German mines produce exclusively for the USSR. Both countries are sensitive about the project and do not report amounts or quality of production. [ ]

[ ] exploitation of some good veins continues although some deposits have been exhausted. Production at the several mines is controlled by the Soviet-German Mining Company Wismuth, headquartered in Karl-Marx-Stadt and staffed in part by Soviets. [ ] the firm may currently employ several thousand East German miners. [ ]

**The Residual**

The Soviets hide their most sensitive trade in unspecified "residual" categories. In 1984, unspecified East German machinery exports to the USSR totaled 910 million rubles and residual exports for the other commodity groups were 997 million rubles; together, these accounted for over 25 percent of East German exports. Some of the machinery residual may include research and development services, repairs, licenses, and patents that the Soviets include in merchandise trade, whereas Western practice treats such items as invisibles. Western studies of Soviet trade statistics have concluded that the Soviets also lump into the overall residual sensitive items such as precious metals, strategic materials, and military-related goods that they do not wish to disclose. East German deliveries in these categories could include uranium, some chemical products, military equipment, high-tech goods (particularly for defense industries), and some steel products that are not reported elsewhere despite Soviet and East German reports of such deliveries. [ ]

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**Secret****Joint Investments**

Some East German exports to the USSR have been to support joint investment projects, organized either bilaterally or under CEMA auspices. These involve primarily energy development and exploitation of other Soviet natural resources. The East Germans contributed goods and labor worth about 1.7 billion rubles for such projects in 1976-80, according to the East Germans, and an unknown amount in 1981-85. The major efforts have centered on gas pipeline construction, development of iron ore deposits, and the production of cellulose and asbestos. [ ]

Between 1974 and 1978 the GDR joined the other East European countries in the construction of a natural gas pipeline from the Orenburg gasfield in the USSR to Eastern Europe—the largest CEMA-sponsored project to date. East Berlin ultimately provided perhaps \$300 million to \$400 million in hard currency financing, materials, and labor in return for 2.8 billion cubic meters of gas annually over 15 years. Its main responsibility was to build pipeline and infrastructure in the European USSR. [ ]

East Germany agreed in August 1981 to participate in the construction of the Urengoy-Uzhgorod natural gas pipeline to Western Europe in return for maintenance of the level of Soviet gas deliveries, which then totaled 6.3 billion cubic meters annually. East Berlin agreed to supply materials and labor to build 546 kilometers of line and seven compressor stations. Some 8,000 to 10,000 East Germans continue to work on the project. [ ]

East Germany has begun preparations for its part in the development of the Krivoy Rog iron ore deposit in the Ukraine, which is scheduled for completion in the late 1980s. [ ]

[ ] In early July 1985, Mansfield created a new firm specifically to manage the East German participation in the construction, and the combine has already begun delivering materials. [ ]

In early 1986, the GDR agreed to help build the "Progress" Pipeline from the Yamburg gasfield in return for natural gas supplies. According to the Soviet press, the East Germans will construct compressor stations and some pipeline. The project is scheduled for completion in January 1989. [ ]

**East German Dependence on Soviet Supplies**

The bilateral economic relationship is critical to East Germany, which in 1984 conducted 38.6 percent of its total trade with the USSR. The GDR's dearth of natural resources makes it highly dependent on imports of raw materials from the Soviet Union and obligated to ship a major share of its industrial output to pay for Moscow's deliveries (see inset).<sup>2</sup> Moscow provides by far the largest share of East Germany's needs for oil, natural gas, forest products, and ferrous metals (see table 7). East Berlin's limited hard currency resources, a transportation system built to receive Soviet supplies, and the close overall relationship with the USSR give East Germany little alternative to the USSR as a major source of imports. [ ]

Soviet exports, however, have not kept pace with the growth of the East German economy in recent years. Deliveries of many raw materials were lower in 1984 than they were in 1975, while official GDR statistics show that industrial production grew 49 percent during the period (see table 10 foldout at back of book). Although Soviet oil deliveries fell in the early 1980s, East German industrial production in 1984 was 17 percent higher than in 1980. [ ]

Gradually declining Soviet deliveries have prompted the Honecker regime to try to replace imports from the USSR by increasing domestic production—particularly of lignite—and by buying from other countries.

<sup>2</sup> The GDR's major resource is lignite, which the country uses primarily as fuel for electricity generation. The East Germans also use it for industrial boiler fuel, home heating, chemical feedstocks, and conversion into liquid and gaseous fuels. The GDR has exportable quantities of potash and small quantities of copper and natural gas. Uranium mined in the southern part of the country has gone exclusively to the USSR since 1945. [ ]

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*The Costs to East Germany*

East Germany's major disadvantages in the relationship stem from the high degree of dependence of many of its specialized industrial combines on the Soviet market. Entire industries are so tightly linked to Soviet customers that their freedom of action is severely restricted and their bargaining position weakened. A variety of sources indicate that the USSR buys large shares of East German production of mainframe computers (70 percent), railcars (75 to 80 percent), cranes (50 percent), machine tools (40 percent), and fishing boats (100 percent). [redacted]

Dependence on the USSR for markets and supplies has made East Germany vulnerable to changes in Soviet trade policy. A variety of sources, including the East German and Soviet press, indicate that the Soviets occasionally have both increased orders sharply and unilaterally cut back deliveries. The 1982 reduction in oil sales on soft currency terms was the most prominent example [redacted]

Because the Soviets have first claim on many of East Germany's most technologically advanced goods, East Berlin is often faced with tough decisions on how to allocate the remaining output between domestic use and export to the West. For example:

- Soviet demand is limiting East German ability to export to the West its U880 model 8-bit micro-processor, which is based on the Zilog Z-80 device. The GDR has been successful in selling the device in the West on the basis of good quality and low price.

- Over 30 potato harvesters purchased by the GDR Ministry of Agriculture from a domestic producer were diverted to the USSR. The loss could not be recouped because of a shortage of imported parts.

This tight long-term linkage also reduces East German managerial incentives for innovation, quality control, and service. The Honecker regime has tried to reduce enterprise complacency, but Western observers still criticize GDR foreign trade enterprises for having poor service capabilities and for being slow to respond to changing market conditions. [redacted]

At the same time, East German managers have also been forced to improve efficiency and introduce conservation measures. Consumption of energy and raw materials per unit of production fell a reported 2.3 percent in 1984 but still exceeds that in many West European countries. [redacted]

**Energy Deliveries**

We estimate that the USSR currently supplies about 20 percent of East German energy consumption, primarily in the form of crude oil. On a fuel-equivalent basis, oil accounts for 79 percent of Soviet energy

deliveries, while natural gas provides 9 percent and coal 10 percent. Domestically produced lignite, by contrast, supplied 72 percent of primary energy consumption in 1984, according to GDR statistics. The Soviet share in recent years has declined as East Germany has been forced to shift to lignite and seek other sources of oil in response to reduced Soviet supplies. [redacted]

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**Table 7**  
**East Germany: The USSR as a Source**  
**of Selected Imports**

Percent

	1970	1975	1980	1982	1983	1984
Crude oil	89.5	88.8	86.9	81.4	75.3	73.5
Natural gas	0	100.0	100.0	100.0	100 <sup>a</sup>	100 <sup>a</sup>
Hard coal (excluding anthracite) <sup>b</sup>	40.4	68.5	49.4	61.1	70.5	66.3
Hard coal coke <sup>b</sup>	48.7	36.2	36.9	52.2	56.3	63.1
Cotton	92.0	87.3	88.2	86.2	74.3	58.0
Cut wood	93.7	64.6	99.0	99.6	99.6	99.6
Cellulose	30.6	14.0	8.7	49.9	54.4	52.5
Construction machinery <sup>c</sup>	NA	34.1	43.1	17.8	44.5	43.2
Tractors <sup>d</sup>	89.3	10.0	53.0	51.5	41.4	53.7
Steel bars	NA	55.7	54.0	47.9	40.3	41.3
Rolled steel	NA	NA	72.2	63.0	36.7	NA
Raw phosphorous <sup>c</sup>	NA	NA	NA	99.0	NA	NA
Machine tools <sup>c</sup>	33.0	25.2	20.7	22.3	30.3	27.3
Trucks <sup>d</sup>	26.2	NA	7.3	2.8	1.3	2.9

<sup>a</sup> Slightly less than 100 percent.<sup>b</sup> Includes some Polish coal and coke sold on Soviet account.<sup>c</sup> In value terms.<sup>d</sup> Number of units.<sup>e</sup> Tons P<sub>2</sub>O<sub>5</sub> (phosphate).Source: *Statistisches Jahrbuch der Deutschen Demokratischen Republik*, various years.

Soviet energy is even more vital than the one-fifth share implies, however, because lignite cannot easily be substituted for Soviet oil, natural gas, and hard coal deliveries. Moreover, East Germany cannot readily replace Soviet imports because it does not have an alternative delivery system that could handle the required volumes. The gas pipeline from the USSR is the only existing delivery means from any source, and the Friendship Pipeline is the most practical, inexpensive way to meet East Germany's oil needs.<sup>3</sup> [ ]

<sup>3</sup> The pipeline linking East Germany's main port of Rostock to its refinery at Schwedt is smaller than the Friendship Pipeline that carries Soviet oil to the GDR; we are unsure if it could transport the 22 to 23 million metric tons of oil imported annually from all sources if the Friendship line closed, even if Rostock dock facilities could handle this volume. Alternate supplies would have to be carried from Rostock or Hamburg or Polish ports by rail, barge, or truck—an expensive proposition. [ ]

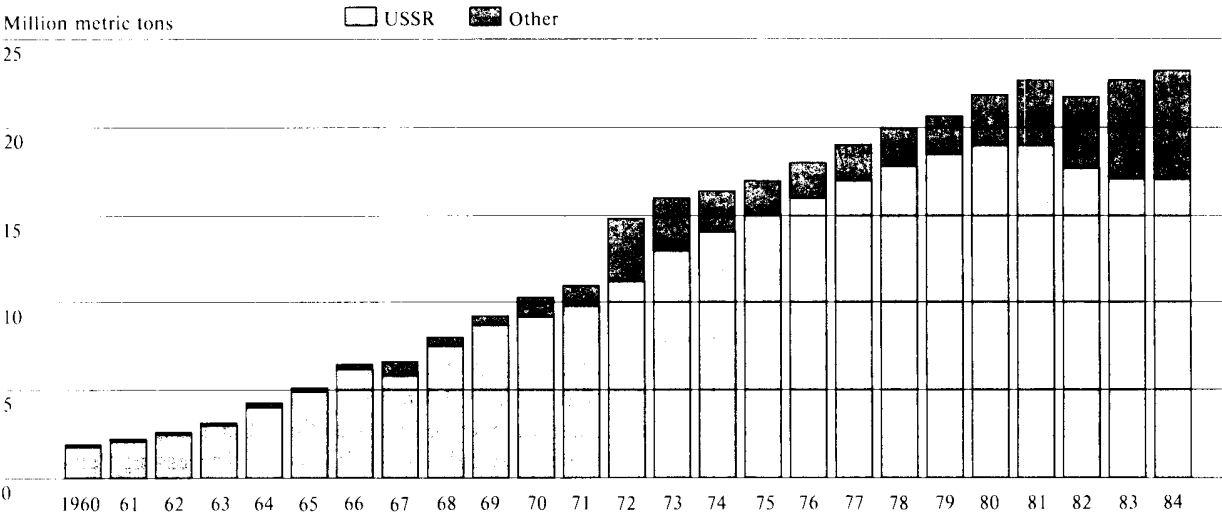
The USSR's major delivery is crude oil. Shipments worth 3.1 billion rubles accounted for 42 percent of all exports to East Germany in 1984, according to Soviet statistics. Moscow for years delivered steadily increasing quantities of oil on soft currency account—growing from 1.8 million tons in 1960 to a peak of 19 million tons in 1981 (see figure 3). Since then, soft currency deliveries have fallen to 17 million tons annually, and the East Germans have sought replacement suppliers.<sup>4</sup> As a result, the Soviet share of reported East German oil imports in 1984 fell to 73 percent. [ ]

<sup>4</sup> East German statistics show actual Soviet deliveries in 1982 above contracted soft currency sales, indicating that East Berlin paid hard currency for some of its imports—about 600,000 tons. Deliveries in 1983 and 1984 were at contracted levels. [ ]

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**Figure 3**  
**East Germany: Sources of Imported Crude Oil,**  
**1960-84**



Source: Statistisches Jahrbuch der Deutschen Demokratischen Republik (various years).

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Much of the Soviet oil is refined for use in the transportation sector, which relies heavily on liquid fuels despite the increased electrification of rail lines in recent years. The GDR also uses substantial amounts of oil for feedstocks in its petrochemical industry and burns some as an industrial heating fuel. Unlike other East European countries, the East Germans apparently have not reexported much Soviet oil to the West to earn hard currency. Although information on this trade is scant, we believe most oil that the GDR refines for reexport to such places as West Berlin is procured from Middle Eastern sources by the East German trading firm Intrac.

The Soviet Union provides nearly all of East Germany's natural gas imports. Deliveries worth 722 million rubles accounted for 9.6 percent of Soviet exports to the GDR in 1984. East Germany uses gas much less extensively than oil, and Soviet supplies are supplemented by domestic sources. Deliveries began in 1973 with the completion of a pipeline to the coal

gasification and petrochemical complex at Schwarze Pumpe in the southeastern GDR. GDR imports in recent years have been 6.2 to 6.4 billion cubic meters, according to East German statistics, and deliveries in 1985 were scheduled to be 6.2 billion cubic meters.

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The East Germans use the gas for feedstocks for petrochemical combines located mainly in the southern and eastern parts of the country. They use Soviet gas as well as gasified lignite to upgrade domestically produced gas that generally is not suited for petrochemical plants because of low heat and high nitrogen content. Soviet gas also supplements the country's "city" gas (*Stadtgas*) system—the domestic network that provides gas to heat homes and factories and for some industrial purposes. Virtually no Soviet-origin

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gas is used for electricity generation. The East Germans recently have experimented with liquified natural gas as a fuel for vehicles, but no major program has been implemented. [ ]

Soviet deliveries of hard coal and coke are fairly small—about 4 million tons annually in recent years—but important because East Germany has exhausted its deposits of hard (bituminous) coal. We believe that the GDR uses these imports almost exclusively in industry—particularly in the metallurgical and chemical sectors—while relying on domestic lignite for home heating and electricity generation. Much of this “Soviet” coal actually is mined in Poland but sold on Soviet account under a complicated trilateral trade agreement. The Honecker regime is trying to reduce coal imports from all sources by increasing lignite production and making more lignite coke. [ ]

Purchases of electricity on Soviet account delivered through the CEMA power grid accounted for 43 percent of East Germany’s electricity imports in 1984, while Soviet statistics show sales of 1.8 billion kilowatt hours, worth 50 million rubles. Total domestic electricity consumption in 1984 was 110.4 billion kilowatt hours, according to East German statistics. [ ]

#### **Nonenergy Raw Materials and Intermediate Goods**

East Germany receives most of its imported nonenergy raw materials and intermediate goods from the USSR. Ranging from cotton to platinum group metals, these deliveries are crucial to East German industry and the country’s hard currency solvency. Imports of ferrous metals, the most important category, totaled 899 million rubles in 1984. The East Germans bought 718 million rubles’ worth of rolled product for their metal-fabricating and machine-building industries. They also purchased pig iron, steel scrap, and iron ore. [ ]

The East Germans use some Soviet chemical products—84 million rubles’ worth in 1984—in their large chemical industry. Deliveries are concentrated in high-energy content and low-value-added categories such as phenols, alcohol, and carbon black. The East Germans typically process them further. [ ]

Soviet deliveries of lumber and wood products—297 million rubles in 1984—account for nearly all GDR wood imports. Supplies include lumber, paper, wood pulp, timber, beams, plywood, and cardboard. The East Germans use these products in their paper industry, for printing and construction, and for the manufacture of furniture and toys. The GDR sells some of these products to the USSR. [ ]

The Soviets’ main agricultural delivery is cotton. Sales of 86,700 tons, worth 109 million rubles, accounted for 58 percent of East German cotton imports in 1984. The East Germans use the fiber in their large textile industry and return some of the cotton to the USSR as clothing. They also depended significantly on Soviet grain deliveries until the early 1970s. Grain shipments of 3.3 million metric tons in 1970, for example, covered most of the GDR’s import needs. But as agricultural problems and increasing demand at the beginning of the 1970s forced the USSR to import Western grain, the Soviets curtailed and then ended grain deliveries to East Germany before resuming small deliveries in 1984. The Honecker regime has since relied on imports from the West at considerable cost in hard currency. Because of this shift to the West, the share of agricultural products in total GDR imports from the USSR fell from 14.1 percent in 1970 to 1.5 percent in 1984. [ ]

Replacement of Soviet deliveries of nonenergy natural resources by Western sources would constitute a major drain on East Berlin’s hard currency earnings; replacement at prevailing Western prices would have cost considerably more than the GDR’s estimated hard currency trade surplus of \$1.1 billion in 1984. Alternate supplies of these commodities are available in the West—COCOM-controlled nuclear fuel is the major exception—but Soviet soft currency payment terms are more favorable than replacement purchases for hard currency. [ ]

#### **Manufactured Goods**

While considerably less important to the East German economy than raw materials, the GDR nevertheless imports a substantial volume of Soviet manufactured goods. Machinery deliveries totaled 810 million

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rubles in 1984, according to Soviet statistics, and consumer goods shipments accounted for an additional 37 million rubles. As the East Germans have been pressed in the 1980s to trim their trade deficits, they have reduced imports of Soviet manufactured goods. From 1980 to 1983, the value of such shipments declined 9 percent, according to Soviet statistics, before beginning to rise again in 1984. [ ]

The East Germans bought 272 million rubles' worth of electronics and electrotechnical products in 1983, according to East German statistics. These items generally are exchanged under the specialization agreements that send East German manufactures to the USSR in return. In computers, for example, the Soviets provide high- and low-capacity computers that complement the GDR's medium-capacity mainframe output. [ ] the Soviets also deliver components, including microelectronics, used in manufacturing computers. [ ]

The Soviets also supply electric power generating equipment, mostly major components for nuclear and thermal electric power plants, including generators. Soviet statistics show deliveries of power engineering equipment worth 139 million rubles in 1984. [ ] [ ] 45 percent of the electricity generated in the GDR comes from Soviet-supplied equipment. The East Germans operate four 440-MW nuclear units and an experimental 70-MW station. They are constructing more 440-MW units and are building 1,000-MW units at the "Bruno Leuschner" Station, but their nuclear program—part of the CEMA effort led by the USSR and Czechoslovakia—is progressing slowly. Installed nuclear capacity of 1,830 MW produced 11.7 billion kilowatt hours of electricity in 1984—10.7 percent of the electricity generated in the GDR. [ ]

The Soviets exported 202 million rubles' worth of transportation equipment to the GDR in 1984. Large Soviet locomotives are used extensively for hauling intercity passenger and freight trains. Soviet truck sales are minimal, in part because the GDR itself makes good trucks. Soviet auto deliveries, particularly the Lada, help keep down the waiting time for prospective car buyers. The Soviets in the past have

provided aircraft for the national airline Interflug and may again in the future. The Soviets also supply engines for vehicles manufactured in East Germany. [ ]

The USSR is East Germany's major source of imported agricultural equipment. Under specialization agreements calling for more than 500 million rubles' worth of bilateral trade in 1983, the GDR bought 74 million rubles' worth of agricultural equipment, including tractors and tractor engines. Although tractor sales fell 61 percent during 1980-84, the Soviets have delivered over 70,000 tractors to East German farms since the 1940s. [ ]

Among the other trade categories, the East Germans receive small amounts of machine tools and construction machinery from the USSR (valued at 31 million and 23 million rubles, respectively, in 1984). The unspecified residual totaling 1 billion rubles in 1984 presumably consists largely of military equipment, platinum and other precious metals, and certain chemical products such as nuclear fuel. [ ]

#### **The Relationship Since the 1970s**

The trade ties described above reflect more than three decades of development of the USSR-GDR economic relationship. Trade rose steadily through the 1950s and 1960s as the USSR supported the expansion of East Germany's economy through growing deliveries of energy and raw materials in return for ever greater amounts of East German machinery and consumer goods. Although there were disputes and hard bargaining, both sides generally perceived substantial benefits from the economic relationship because trade was roughly balanced, relative prices were stable, and each needed what the other offered. [ ]

The explosion in OPEC oil prices beginning in 1973 set in motion forces that jolted the equilibrium. Terms of trade shifted sharply in Moscow's favor, which in effect provided the Soviets with a claim to a net

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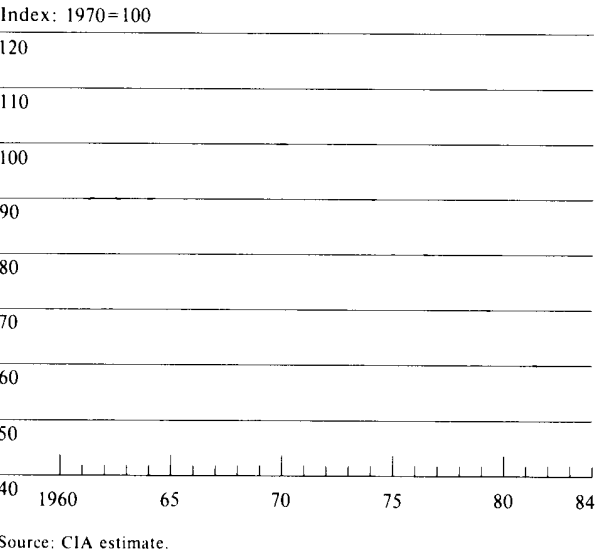
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**Figure 4**  
**East Germany: Terms of Trade**  
**With the USSR, 1960-84**



increase in East German exports that also fluctuated on the basis of the relative value of the dollar (see figure 4). The ultimate effect on USSR-GDR trade mirrored to a large degree the change in relative economic positions in the 1970s between OPEC and Western oil-importing nations—oil exporters enjoyed large gains while importers were forced to divert a larger share of their resources to cover higher oil payments.

The USSR was slow to reap full advantage of the changes in world market prices, allowing East Berlin several years to adjust. CEMA oil prices rose more slowly than OPEC's because of lags built into the CEMA pricing formula (see inset). Although East Germany had to pay somewhat higher prices than previously, Soviet prices remained well below Western prices through the early 1980s (see figure 5).

The Soviets initially eased the blow of deteriorating terms of trade by allowing the GDR to run trade deficits. These deficits—which for a time were the

largest of any East European country—averaged 444 million rubles annually from 1977 through 1982. Soviet statistics show an accumulated East German deficit of nearly 3.8 billion rubles in 1974-84 compared with a small East German surplus during 1949-74, generating a debt that must ultimately be repaid (see appendix C). The trade deficits reflected higher Soviet export prices, Soviet tolerance of moderate growth in GDR exports to the USSR, and Moscow's continued willingness to make good on planned increases in the volume of exports to the GDR. Crude oil deliveries, for example, more than doubled from 9.2 million tons in 1970 to 19 million tons in 1980.

**Soviet Pressures Mount**

Beginning in the late 1970s, however, Moscow became increasingly adamant that the days of continually growing Soviet supplies and large East German deficits must finally come to an end.

Deliveries of Soviet raw materials established in the 1981-85 trade protocol were held basically to 1980 levels.

Despite their promises in the trade protocol, the Soviets began to enact actual cuts in deliveries of key raw materials early in the 1981-85 plan period. Moscow reduced exports of oil on soft currency account to 17.1 million tons in 1982 from 19 million tons in 1980-81.<sup>5</sup> Deliveries of Soviet iron ore fell 17 percent in 1982 and another 12 percent in 1983, according to East German statistics. The Soviets also cut deliveries of coal and coke in 1981-82 because the political and economic crisis in Poland caused cut-backs in deliveries of Polish coal to the USSR. East German statistics show that sales of Soviet hard coal fell 22.5 percent in 1981 and coke deliveries declined 8.7 percent in 1981-82. These cuts aggravated problems caused by shortfalls of Polish coal sold to the GDR directly by Warsaw.

<sup>5</sup> The Soviets also cut deliveries to Hungary and Czechoslovakia by about 10 percent. Diplomatic sources report that the USSR also reduced shipments to Bulgaria in 1985.

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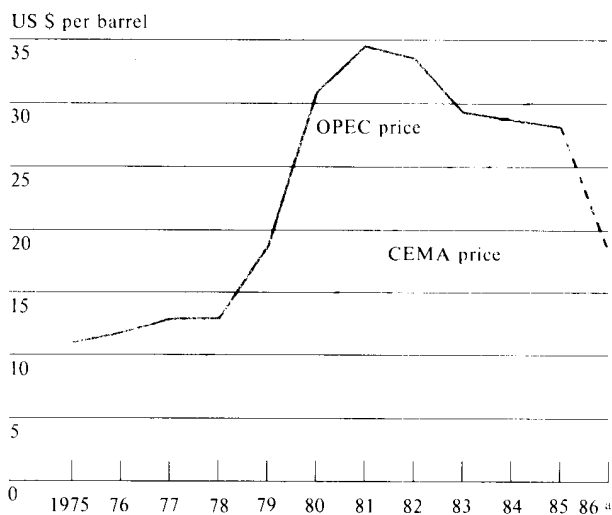
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### The CEMA Price Cushion

The CEMA pricing mechanism granted some relief to Eastern Europe from the inflation of the 1970s in world energy and raw materials prices. Before 1975, commodity prices in CEMA trade for each five-year plan period were fixed at the average of world prices from the previous five-year period. The 1973 OPEC oil price increase thus had no immediate impact on the price of Soviet oil deliveries to Eastern Europe. Because this formula entailed a rapidly growing subsidy from the USSR to its allies and minimal incentives for the East Europeans to conserve energy and raw materials, Moscow pushed through a new price formula—the so-called Bucharest formula—that set CEMA prices equal to the moving average of world prices of energy, raw materials, and some manufactured goods in the five years immediately preceding the current trade year. It also introduced the effects of fluctuations in the relative prices of the Western currencies used in benchmark prices. For the transition year of 1975, CEMA prices were the average of those in the previous three years. The five-year moving average formula took effect in 1976. CEMA oil, for example, was priced in 1976 at the average of world (OPEC) prices during 1971-75. [ ]

The new formula made CEMA prices more responsive to changes in world prices while continuing initially to give the East Europeans a considerable price break. During the period of rising world oil prices, the formula admitted Western inflation into CEMA trade with a lag by annually introducing the impact of high prices from the previous year while eliminating the influence of an earlier year. The recent decline in world energy prices, however, has caused CEMA oil prices under the CEMA formula to exceed world prices since 1984 (see figure 4). Although the Soviets and East Europeans have periodically discussed changing the mechanism, CEMA has consistently renewed the five-year moving average formula. In January 1985, CEMA's Executive Committee announced that it would continue to be used for the 1986-90 period. [ ]

**Figure 5**  
Eastern Europe: Crude Oil Prices,  
1975-86



<sup>a</sup> Preliminary estimate for OPEC price. Market developments during 1986 could alter this estimate by several dollars in either direction. The 1986 CEMA price is based on OPEC prices in 1981-85.

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Moscow's tougher line on trade reflected its own growing economic problems:

- Rising grain import needs and the reluctance of Western bankers to lend to the Soviets in the early 1980s made diversion of oil from soft currency customers to hard currency markets appealing (see inset).
- The Soviet need for natural resources at home grew, and the cost of developing new reserves became increasingly expensive.
- The accumulating Soviet surpluses represented a drain of real resources and made desirable the return of trade to approximate balance. [ ]

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### ***The Burden on the USSR***

*The East German burden on the Soviet Union stems mainly from the delivery of natural resources. Soviet production and exploration costs are rising sharply and, in some cases, production is declining. However, the share of output exported to East Germany is small. Oil deliveries accounted for less than 3 percent of production in 1984, according to Soviet statistics, while natural gas shipments accounted for 1 percent of production. Figures on Soviet exports of coal and coke, about one-half of 1 percent of production in recent years, are overstated because much actually is mined in Poland. It is transferred to a Soviet account under a trilateral trade arrangement.*

*From Moscow's perspective, the key opportunity costs of natural resource deliveries to East Germany are reduced supplies for the domestic economy and lost hard currency export earnings. With both oil and coal production declining and domestic demand growing, the Soviets could well have used those resources at home. At the same time, Soviet hard currency constraints have further enhanced the desirability of exporting oil and other materials to the West. While these potential oil revenues have declined recently as the international market weakened,*

*they nevertheless represent "losses" of about \$3.5 billion on the 17.1 million metric tons delivered to East Germany in 1984.*

*Soviet opportunity costs over the years have been increased by the generous price and credit terms offered East Germany. Western analysts differ sharply on the magnitude of these "subsidies," but it is certain that the CEMA price formula—basically a five-year moving average of world market prices—represented a significant Soviet price concession in the period of rising world energy prices through the early 1980s. This price burden has shifted in recent years, however, as the CEMA formula price matched and then exceeded the OPEC benchmark price. East Germany continued to benefit from Soviet trade credits covering East German deficits in bilateral trade; in effect, the Soviets delivered real resources in exchange only for bookkeeping entries on nontransferable soft currency account. Soviet statistics show a cumulative East German deficit in 1974-84 of 3.8 billion rubles.*

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### **East Berlin Responds and Adjusts**

By 1981, the Honecker regime finally felt obliged to redress the trade imbalance by increasing deliveries to the USSR. The pressure from Moscow, however, coincided with a rapid deterioration in East Germany's hard currency financial position, considerably complicating the process of adjusting to foreign exchange constraints. Despite higher requirements for hard currency receipts, the regime

ordered industrial combines to increase the USSR's priority for exports. East German economic managers faced new penalties for failure to fulfill export goals to the USSR.

East Berlin's efforts resulted in declining GDR trade deficits in most years of the early 1980s. Exports rose 19 percent in 1981, partly to offset worsening terms of trade in the wake of the second oil price shock of 1979-80, and the deficit declined to 372 million rubles. Efforts lagged in 1982, during the worst of East Berlin's hard currency crisis; imports from the USSR rose sharply and the deficit surged to 643 million rubles. A decline in growth in East German imports in 1983 cut the trade deficit to 202 million rubles. In 1984, exports increased nearly 12 percent and imports climbed 10 percent, allowing East Germany to close the trade gap to 114 million rubles, the smallest in a decade.

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The pressures to balance trade continued in 1985. The 1985 protocol called for balanced trade based on greater deliveries of high-quality East German goods.

[redacted] East Berlin reported that, in the first quarter of 1985, despite severe winter weather that cut the growth of both industrial production and the growth of exports to the West, exports to the USSR exceeded plan. For the first three-quarters of 1985, the GDR shrank the deficit to only 300,000 rubles, according to Soviet statistics. [redacted]

The tougher Soviet trade terms—and East Berlin's efforts to meet them—have tightened the economic partnership through a greater East German commitment to the Soviet market. The GDR has boosted trade with the USSR faster than with other parts of the world; the Soviet share of East German foreign trade rose from 31 percent in 1974 to 38.6 percent in 1984. Industries such as shipbuilding and consumer goods have become more tightly bound to Soviet customers as large Soviet orders have altered the composition of GDR exports to the USSR. Long-term contracts and more specialization agreements are furthering the linkages. [redacted]

Soviet pressures to close the trade gap—as well as coincident Western financial pressures—forced the Honecker regime to enact stringent domestic adjustment measures (see appendix D). The effort to respond to Soviet demands for consumer goods and other industrial products, along with the need to export more to the West, contributed to the stagnation of the East Germans' real personal consumption in 1982-83. The regime also had to make large reductions in total investment and to embark on an expensive program of energy conservation and substitution. [redacted]

To accommodate Moscow, as well as to adjust to its other external constraints, East Berlin has restructured portions of its industry, including:

- Electronics and electrical engineering, which in recent years has been among the most favored industrial sectors. East Germany especially is pushing microelectronics and robotics, accounting for the relatively rapid growth of output in this sector in recent years.

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- Machinery, where the regime is pushing development of more sophisticated and efficient machines, many with microelectronic components. Honecker has made it clear that he intends to continue to restructure the economy along these lines and that the sector is slated to continue to grow rapidly. In 1985, East Berlin established a new combine exclusively for the production of complete manufacturing lines.

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- Consumer goods, which even heavy industrial combines are now being ordered to produce. While the regime is promising better supplies for the domestic consumer, much will be exported to the USSR and the West.

- Shipbuilding, where the press reports that Soviet orders are keeping shipyards operating at capacity. The East Germans are designing and building new classes of vessels for Soviet customers exclusively and are making major investments to boost production and expand the variety of output.

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- Food-processing equipment, for which the GDR restructured its farm equipment combine in order to support the Soviet Food Program [redacted]

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#### Outlook Through 1990

Growth of East German and Soviet trade is slated to slow during 1986-90 and its composition will change. Because the trade imbalance of the past decade has been largely corrected, a continuation of recent trends would move the trade balance in East Berlin's favor.

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This reversal in trade balance could repay East Germany's accumulated trade deficits and ultimately weaken the Soviet claims on East German exports.

### **Moscow's Hard Line**

Moscow has talked tough about trade with Eastern Europe during the 1986-90 plan period. In bilateral negotiations, during the CEMA premiers' session in East Berlin in November 1983, at the June 1984 CEMA summit, and in subsequent regular CEMA meetings and the S&T talks, the USSR has stated that it wants a more "balanced" economic relationship. In a message that has changed little despite the succession of party leaders in recent years, the Soviets have stressed that continued exports of energy and other raw materials depend on more East European investment in Soviet development projects and that the East Europeans must put a higher priority on supplying the Soviet market. The Soviets have singled out machinery, food, and consumer goods for special attention and have emphasized quality, complaining about the traditional East European practice of shipping the best products to the West for hard currency.

The USSR's policy probably reflects concern about prospects for its trade with the West as well as its domestic economic problems. We expect that Soviet hard currency oil revenues will continue to decline for the remainder of the decade, constraining hard currency import capacity. At the same time, resource development costs are rising sharply, and the domestic economy remains inefficient. In these circumstances, one of the Soviets' most attractive options is to obtain substitutes from Eastern Europe for goods that are unavailable at home or are purchased from the West for hard currency.

Public statements on trade negotiations indicate that Moscow believes that East Germany—with the most highly developed industrial base, significant research and development capabilities, and probably the most politically stable regime in Eastern Europe—is capable of delivering more of the

goods the Soviets want. The Soviets know that the GDR has recovered from many of the economic problems it faced in the early 1980s. East Germany's hard currency financial position appears sound, Western banks now are eager to lend, and West Germany continues to provide a substantial flow of economic and financial assistance. Moreover, the GDR has managed to run surpluses in hard currency trade and roughly balanced trade with the USSR while posting robust economic performance—an estimated 3-percent growth in GNP in 1984. Its economic and financial strength give East Berlin more scope than most East European governments to cope with tougher Soviet requirements.

The East German leadership acknowledges in public statements that it has little choice but to meet Moscow's demands. Honecker told the 9th Central Committee Plenum in November 1984, "It is necessary continuously to ensure an attractive offer by the GDR that corresponds to the requirements of the Soviet economy." Premier Willi Stoph made the same point to the legislature (*Volkskammer*) in presenting the 1985 economic plan: "In the next years we will even more strongly change our production and export structure in accordance with the demand of the USSR."

### **Trade in 1986-90**

The agreement on economic plan coordination for 1986-90 signed by East Germany and the USSR in October 1985 (and the trade protocol signed 2 months later) generally reflect Moscow's requirements for future economic relations. Press releases indicate that the East Germans complied with Moscow's demands for more consumer goods, better quality machinery, and investment in Soviet resource development. While the East Germans apparently warded off threatened cutbacks in deliveries of some Soviet raw materials, Moscow did not promise major increases in its key exports. The agreement indicates that nominal trade will grow at a much slower pace than in 1981-85. Trade of 82 billion rubles during the five-year period is 24 percent higher than in 1981-85,

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indicating a roughly 3-percent annual growth rate over the projected 1985 level. This is the slowest planned growth rate in 15 years and only about one-quarter of the actual growth in trade in 1981-84. A leveling off—if not an outright decline—in Soviet prices is an important factor behind the slowdown in trade growth.

East Berlin agreed to increase deliveries of some key commodities to support Soviet domestic priorities. The protocol calls for GDR exports of consumer goods and chemicals to increase 40 percent and 50 percent, respectively, over the 5-year period. The protocol also

stresses the importance of greater cooperation in science and technology and increased trade in goods to improve labor productivity such as computers, electronics, robotics, numerically controlled machine tools, and flexible manufacturing systems. Accordingly, East German exports of electrical engineering products, computers, and information technology are scheduled to more than double over the next five years (see table 8).

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**Table 8**  
**East Germany: Selected Machinery Exports to the**  
**USSR in 1986-90 <sup>a</sup>**

	1980-84 (billion rubles)	1981-85 <sup>b</sup> (billion rubles)	1986-90 <sup>c</sup> (billion rubles)	1986-90/ 1980-84 (percent change)	1986-90/ 1981-85 (percent change)
Ships	2.21	2.53	2.67	21	6
Electrical engineering products	0.49	0.50	1.07	118	115
Railroad equipment	1.47	1.68	1.56	6	-7
Chemical plant and equipment	0.79	0.87	1.07	35	23
Agricultural machinery	2.05	2.33	2.46	20	6
Machine tools	2.00	2.40	3.21	61	34
Computer technology products	0.97	1.00	2.14	121	113

<sup>a</sup> This table includes only those machinery categories for which fairly explicit figures for 1986-90 were given in press reports.  
<sup>b</sup> CIA extrapolation of 1980-84 trend.

<sup>c</sup> Announced in the Soviet and East German press.

Sources: Official Soviet trade data and press.

Announced increases in machine tool deliveries are more modest—roughly 34 percent or just over half the growth rate of the current five-year plan. We surmise, however, that the slowdown reflects cutbacks in exports of conventional metal-cutting tools while shipments of numerically controlled and specialized tools will grow more rapidly. The East Germans will also increase significantly deliveries of equipment to the Soviet consumer goods and food-processing industries and invest in energy and raw material projects in the USSR. [ ]

The overall growth rate for trade is held down in part by small increases in several traditionally important East German exports to the USSR. Deliveries of ships and agricultural machinery will rise only marginally in value in 1986-90. Increases in equipment for the chemical industry will total only 23 percent over the period. Sales of railroad equipment are slated to decline. [ ]

Moscow promised to at least maintain current deliveries of key raw materials and energy (see table 9). The Soviets agreed to ship 85.4 million metric tons of crude oil, or an average of 17.08 million tons annually. The total projected over the five years is a decline

from the amount supplied in 1981-85 but equals, on average, a continuation of the 1985 level of shipments. The USSR will increase its sales of natural gas, coal, and iron ore. [ ]

[ ] The East Germans probably have prepared for these cutbacks and have the financial resources to buy replacements in the West. While probably more than East German planners initially anticipated, the projected levels of energy and raw materials deliveries will force the GDR to continue improving the efficiency of the economy to maintain growth. [ ]

The Soviets will deliver more manufactured goods. Moscow promised increased deliveries of microelectronic components, many of which may return to the USSR in finished products. As part of the increased effort in technical cooperation and production specialization, the USSR will deliver more machine tools and begin supplying flexible manufacturing units. The

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**Table 9**  
**USSR: Projected Resource Deliveries to**  
**East Germany in 1986-90**

Commodity	1986-90 Plan	1983		1984
	Total	Annual Average		
Crude oil ( <i>million tons</i> )	85.4 <sup>a</sup>	17.08 <sup>a</sup>	17.05 <sup>a</sup>	17.07 <sup>a</sup>
Natural gas ( <i>billion cubic meters</i> )	34.5	6.9	6.412	6.167
Hard coal <sup>b</sup> ( <i>million tons</i> )	22.5	4.5	3.98 <sup>b</sup>	3.55 <sup>b</sup>
Iron ore ( <i>million tons</i> )	8.5	1.7	1.37	1.215
Rolled steel ( <i>million tons</i> )	16.0	3.2	NA	NA
Crude iron ( <i>million tons</i> )	4.8	0.96	NA	NA
Cellulose ( <i>million tons</i> )	0.49	0.098	0.80	0.86
Pulp wood ( <i>million cubic meters</i> )	4	0.8	NA	NA
Sawn timber ( <i>million cubic meters</i> )	6.5	1.3	1.286	1.366

<sup>a</sup> Deliveries on soft currency account.

<sup>b</sup> Combined hard coal and coke.

Sources: Official East German and Soviet trade statistics and press releases.

Soviets also will build a 2.5-million-metric-ton hot-rolled steel mill during the period at the GDR's main steel complex at Eisenhuettendorf. [ ]

#### Net Flow of Resources

While press reports announced some targets for trade in 1986-90, they did not reveal the projected trends in prices and trade balances that will determine the net flow of resources between the USSR and the GDR.

[ ] Forecasts through 1990, however, can only be tentative given our limited knowledge of the details of the plan coordination protocol and a history of midperiod alteration in plans. Moreover, the actual outcome will be shaped by future movements in world prices for oil and machinery as well as by the terms of annual trade protocols and East German investments in Soviet resource development. [ ]

Terms of trade may turn in East Germany's favor for the first time since the early 1970s. The price of Soviet oil, for example, should fall if Moscow continues to adhere strictly to the CEMA price formula. If

the OPEC contract price of oil (as opposed to the often lower spot price) collapses to \$20 per barrel in 1986 and remains there through 1990, the CEMA formula would have Soviet prices decline steadily to \$21.86 in 1990—nearly 30 percent below the 1985 price. This would reduce the USSR's export receipts from East Germany by about 1 billion rubles annually. Moreover, falling oil prices would put downward pressure on prices of natural gas and coal, and prices of nonenergy raw materials may soften as well. Thus, the cost of some 70 percent of Soviet exports could well decline, a substantial gain for East Berlin. East Germany's terms of trade would improve still further if world prices of manufactured goods continue to rise.

[ ] The Soviets, however, apparently already are trying to reduce, if not eliminate, the prospective improvement in the GDR's terms of trade. [ ]

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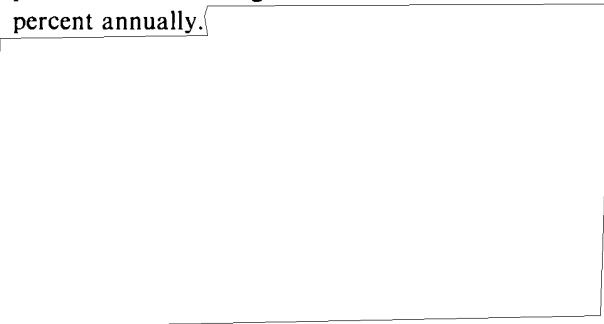
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planners, nevertheless, accepted price hikes amounting to 1 billion rubles for natural resources in 1986-90 and incorporated the increases into their planning. The extra 1 billion rubles would correspond to an average annual price increase of 2.5 percent over the five-year period; by comparison, East German export prices have been rising at an estimated rate of 4.5 percent annually.



We conclude from this evidence that prices incorporated in the plan coordination agreement probably will result in some deterioration in the USSR's terms of trade. East Berlin may not capture all the gains due it under strict application of the CEMA price oil formula, but this outcome is still more favorable for East Germany than the trend of the past decade. Modest changes in the terms of trade imply that price movements are unlikely to be a major determinant of trade balances, or shifts in real resource flows, as they were during the years of spiraling Soviet oil prices.



Even if the terms of trade are no longer moving in its favor, the USSR can obtain more exports from East Germany by insisting on repayment of East Berlin's accumulated trade deficits. Repayment would be in keeping with the CEMA principle that trade, over time, should be in balance. Moreover, Moscow can boost its real resources receipts under the rubric of "burden sharing." 



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On balance, we believe that the plan coordination protocol probably calls for East German surpluses, averaging perhaps several hundred million rubles annually. Moscow has provided no recent indications that it is concerned about receiving too much from East Germany, and the trade imbalance issue has not reappeared 

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Soviet public statements have repeated the theme of more goods and investment from Eastern Europe in return for, at best, current levels of exports from the USSR. We judge that the projected East German surplus for 1986-90 is probably on the order of 1.5 billion rubles [redacted]

[redacted] though it may well be less. [redacted]

The meager details of the plan coordination agreement, added to what we know about prices and the trade balance, suggest that East Germany has largely completed adjustment of its overall trade with the USSR to the price shocks of the 1970s. Slow trade growth and modestly improving East German terms of trade imply that increases in real resource deliveries to the USSR are likely to be less than in recent years even if East Berlin begins to repay its debt. If we assume a 2-percent annual improvement in East Germany's terms of trade and surpluses of 300 million rubles annually, net East German exports would grow by about 4 percent per year in real terms. By comparison, real net exports grew by an estimated 8 percent annually in 1981-84 when the East Germans accelerated deliveries to offset worsening terms of trade and to reduce the deficits. [redacted]

#### Other Burdens on the GDR

The trade accounts, however, do not measure all the costs of meeting Moscow's requirements. With the trade relationship now much closer to balance, the GDR's main task is shifting from increasing deliveries to improving the quality and composition of its exports. [redacted]

[redacted] Greater investment requirements—coupled with moderate growth in real exports to the USSR—may well mean that domestic uses, possibly including

private consumption, will receive a declining share of output. Furthermore, research and development tasks arising from closer S&T cooperation could mean that more of East Germany's own capabilities as well as technology acquired from the West will be directed to the needs of the Soviet economy. [redacted]

The evolution of the bilateral economic relationship set forth in the protocol will test East German management skills, but we expect East Berlin to meet most of its commitments. The longstanding mutual benefits from the relationship will remain largely unchanged. The GDR seems likely to maintain or even increase its importance to the USSR as a supplier of more technically advanced machinery and better quality consumer goods than are available elsewhere in CEMA. At the same time, the Soviets will continue to supply most of the energy and raw materials that undergird East German industry. Soviet demands for improved quality and greater conservation may even prove beneficial in the long run if they spur the East Germans to continue improving the efficiency of their economy and to develop new technologies useful to both countries. [redacted]

#### Risks for the Relationship

The outlook for trade could be altered significantly, however, by serious changes in economic conditions or Soviet policies. If actual performance shows the USSR's five-year domestic economic plan to be much too optimistic, Moscow could reopen terms of the plan coordination protocol. The Soviet decision to cut oil deliveries in 1982, in violation of the 1981-85 trade protocol, is a precedent. The most likely areas for changes are further reductions in deliveries of Soviet raw materials, additional demands on East German industry, and Soviet requirements that may not show up in trade accounts. [redacted]

Shipments of some raw materials and energy could be curtailed if Soviet production problems increase, Moscow's hard currency earnings falter, or East Berlin fails to meet its trade and investment commitments. Rumors have recurred in East European capitals during the past two years that the Soviets will make

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another cut in soft currency oil exports during the 1986-90 plan period. Another reduction of 2 million tons would take about 350 million rubles off East Germany's soft currency import bill at current prices, but could cost about \$300 million to replace by purchases on the world market or from the USSR for hard currency. Given its presently strong financial position, East Germany could manage another cut of this size without major difficulty, but replacement would cost East Berlin about half of its estimated 1985 hard currency trade surplus. [redacted]

Natural gas shipments could fall below projected levels. Most of the increase in planned gas deliveries is scheduled to begin in 1989 when the Yamburg (Progress) pipeline is completed. Deliveries may not rise, however, if the project experiences construction delays. Cutbacks in deliveries of less important natural resources could also occur. [redacted]

Steep declines in the volume of Soviet raw material exports, particularly oil, would have serious implications for both sides. At a minimum, a large cutback would push the USSR deeply into deficit in trade with East Germany or weaken Moscow's claim on GDR exports. More seriously, severe cutbacks could disrupt the East German economy, including production for the USSR, threaten East Berlin with a hard currency financial crisis, and heighten the risk of political unrest. These factors presumably would weigh heavily against a decision to slash exports vital to East Germany. [redacted]

The Soviets could insist on additional GDR deliveries, or ask for a shift in the composition of deliveries, in return for maintaining exports of energy and raw materials. Additional East German deliveries could replace goods now obtained by the USSR from hard currency suppliers while shielding the GDR from a severe cutback in oil supplies brought on by oil production problems. [redacted]

[redacted] increased East German shipments of consumer goods in recent years, for example, may not have been part of the 1981-85 trade protocol. Changing or increased orders probably would be less disruptive to the East German economy in the short run than reductions in Soviet exports, but could force significant longer term adjustments. [redacted]

Markedly increased Soviet demands on East German industry could require more changes in the level and allocation of East German investment, depressing the economy's growth prospects. Increased Soviet orders also could prove costly to East Berlin by forcing a reduction in East Germany's trade with the West and other CEMA countries. The Soviets presumably are aware of these risks and would try to limit injury to the GDR's economy except in the case of major domestic need. [redacted]

Should Soviet needs so require, Moscow might justify new demands on the basis of greater "burden sharing," insisting on additional East German contributions to:

- Defense spending. Over the longer term, the USSR could ask East Berlin to shoulder more of the economic cost of stationing Soviet forces in the GDR, to increase military R&D efforts, or to accelerate modernization of East German military forces. East Berlin would find it very difficult to resist Soviet requests during defense coordination talks for more hardware procurement—much of which comes from the USSR—if it has a significant trade surplus with the USSR or its economic growth and financial position remain strong. Defense spending in 1986 is slated to rise 7.7 percent, somewhat above the growth rates of recent years, and Honecker has publicly indicated that East Berlin must pay some of the costs of the Soviet "counter-deployment" of short-range nuclear missiles in East Germany.

- Foreign aid. The Soviets could ask East Berlin to shoulder a larger share of assistance to Third World client states. [redacted]

The amount of resources East Germany could provide in response to such demands would not markedly improve the Soviets' overall economic position but could reduce Soviet costs and impose noticeable additional burdens on the East German economy. [redacted]

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## Appendix A

## USSR-East Germany: Bilateral Trade

	East German Exports		Soviet Exports		East German Balance ( <i>million current rubles</i> )
	<i>Million current rubles</i>	Percent change over previous year	<i>Million current rubles</i>	Percent change over previous year	
1960	836.4	NA	946.5	NA	-110.1
1961	788.3	-5.8	1,088.2	15.0	-299.9
1962	965.4	22.5	1,235.5	13.5	-270.1
1963	1,227.4	27.1	1,182.5	-4.3	44.9
1964	1,194.9	-2.6	1,246.7	5.4	-51.8
1965	1,156.2	-3.2	1,226.7	-1.6	-70.5
1966	1,114.2	-3.6	1,266.1	3.2	-151.9
1967	1,271.4	14.1	1,274.6	0.7	-3.2
1968	1,444.8	13.6	1,355.8	6.4	-89.0
1969	1,466.4	1.5	1,565.1	15.4	-98.7
1970	1,556.9	6.2	1,738.1	11.1	-181.2
1971	1,727.5	11.0	1,715.9	-1.3	11.6
1972	2,034.7	17.8	1,670.8	-2.6	363.9
1973	2,108.9	3.6	1,856.4	11.1	252.5
1974	2,150.7	2.0	2,164.6	16.6	-13.9
1975	2,643.1	22.9	2,980.3	37.7	-337.2
1976	2,779.3	5.2	3,217.9	8.8	-210.8
1977	3,066.3	10.3	3,661.2	13.8	-594.9
1978	3,771.2	23.0	3,982.0	8.0	-438.6
1979	3,917.0	3.9	4,216.5	5.9	-299.5
1980	4,326.6	10.5	4,873.4	15.6	-546.8
1981	5,154.6	19.1	5,526.1	13.4	-371.5
1982	5,776.2	12.1	6,419.6	16.2	-643.4
1983	6,595.7	14.2	6,797.8	5.9	-202.1
1984	7,367.2	11.7	7,481.4	10.1	-114.2
1985 <sup>a</sup>	5,618.7	0.1	5,619.0	4.3	-0.3

<sup>a</sup> First nine months.

Source: Soviet foreign trade statistics.



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Appendix B

Rubles Per US Dollar	
1950-71	0.900
1972	0.823
1973	0.739
1974	0.758
1975	0.720
1976	0.754
1977	0.737
1978	0.681
1979	0.655
1980	0.649
1981	0.719
1982	0.726
1983	0.743
1984	0.816

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## Appendix C

### The Financial Relationship

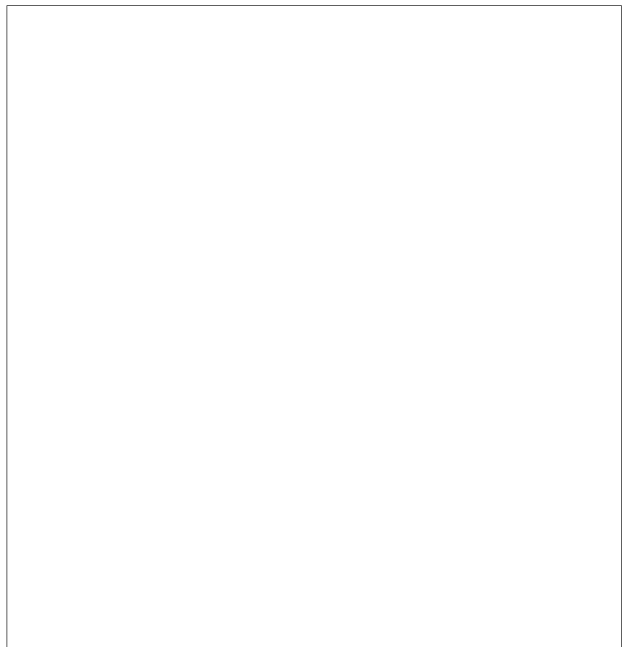
The East German-Soviet financial relationship consists of two distinct aspects—soft currency financing of bilateral trade in goods and services and East German borrowing from Soviet-owned banks in the West to help meet hard currency needs. Neither side reports data on these financial transactions, but the limited information available indicates that East Germany's soft currency obligations to the USSR are the larger of the two debt components. [REDACTED]

By allowing East German deficits of 3.8 billion rubles in bilateral trade in 1974-84, the USSR authorized the growth of an East German debt that apparently had been minimal previously. Estimating this debt from cumulative trade deficits is open to challenge because it presumably does not account for transfer and service payments nor compensation for East Germany's role as a Soviet surrogate in Third World countries. [REDACTED]

[REDACTED] We are unaware of service earnings large enough to offset the major share of the accumulated trade deficits. We also are unsure of the terms of payment by the Soviets for East German support of Soviet military forces in the GDR; the expense of some of these activities may be borne entirely by the GDR. We believe that most financial obligations stemming from military-related trade are implicitly counted in the trade balances under the "residual" and unspecified "machinery" trade accounts. [REDACTED]

East Berlin's debt could be lower than 3.8 billion rubles if capital flows and labor services for East German investment in natural resource projects in the USSR are not captured in the trade statistics. At least some of the East German deliveries for the Orenburg gas pipeline project, however, were counted in Soviet imports. Thus, we think the summation of trade deficits gives the best—albeit rough—approximation

of East Germany's debt to the USSR. We believe that this debt is almost entirely in soft currency because there does not appear to be any significant amount of hard currency trade between the two countries. [REDACTED]



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We estimate that East Germany's outstanding hard currency borrowing from Soviet-owned banks in the West totaled roughly \$200 million to \$300 million in late 1985. This almost certainly represented a substantial reduction from the levels of a few years earlier. [REDACTED]

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## Appendix D

### East German Adjustment to Soviet Pressures

Soviet demands for a reduction in East Germany's trade deficit, coupled with Western financial pressures, forced the Honecker regime to enact stringent domestic adjustment measures. While depressing living standards and dislocating investment plans, we believe these measures helped to improve the efficiency of the East German economy, including a reported 2.3-percent decline in unit production costs in 1984 and a 2.5-percent reduction in 1985. [ ]

Reduction in Soviet energy supplies and rising prices prompted the regime to impose conservation measures—largely by reducing fuel allocations—while encouraging increased usage of domestically produced lignite. The regime devoted 78 percent of investment in industry to the energy sector in 1984, according to State Planning Commission chief Schuerer. As a result, lignite's share of East Germany's primary energy consumption rose to 72 percent in 1984 from 54 percent in 1980. [ ]

The oil constraint prompted East Berlin to shift its transportation mix markedly. The regime accelerated its rail electrification program—from 93 kilometers in 1980 to a projected 300 kilometers in 1985—in order to save diesel fuel. The regime also pushed the use of inland water transportation and issued strict new regulations on the use of motor vehicles; the reserve of idled vehicles probably contributed to the sharply lower East German purchases of Soviet motor vehicles in recent years. The result has been a 23-percent reduction in tonnage hauled by motor vehicles between 1980 and 1984. [ ]

East Germany's external adjustment forced tough choices in division of an investment pie that shrank 2.6 percent in nominal terms during the period 1980-84. The share of investment in national income dropped from 22.7 percent to 16.9 percent as the regime postponed imports of capital goods in order to redress the trade imbalance. The share of investment devoted to industry grew largely because of efforts to modernize facilities, develop and conserve energy, and

meet new Soviet demands—while the shares going to construction, agriculture, domestic trade, and “non-productive” sectors such as government declined. [ ] 25X1

At the same time, increasing Soviet demands for East German consumer goods cut the supply available for domestic use. This factor, along with the need to export more to the West, has caused a stagnation of East German real personal consumption in recent years. We estimate that personal consumption declined absolutely in 1982 after years of consistent increases, and that real growth has been modest in 1983-85. [ ] 25X1

The changing bilateral economic relationship has affected East German economic activities with other countries, particularly by forcing the regime to look elsewhere for needed supplies. East Berlin has:

- Expanded its use of barter and countertrade. East Berlin has, for example, boosted imports of oil from Iran and Iraq in return for greater deliveries of military and military-related goods, including trucks. Oil imports from non-Soviet sources reached 6.2 million tons in 1984, up from 2.9 million tons in 1980, and accounted for over one-fourth of oil imports, the highest percentage ever. 25X1

- Sought alternative suppliers, including international commodity markets, for a broad spectrum of other commodities. [ ] 25X1

[ ] The East Germans, for example, have sought manganese ore from Ghana—a metal the Soviets have threatened to cut. While East Berlin has signed some agreements, it also has been rebuffed by LDC's, such as Indonesia, apparently wary of East Germany's political links to the USSR. 25X1

- Used the intra-German “special relationship” where possible to acquire alternative supplies. [ ] 25X1

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**Table 10**  
**East Germany: Imports of Selected**  
**Commodities From the USSR**

	Crude Oil (thousand tons)	Natural Gas (million cubic meters)	Bituminous Coal <sup>a</sup> (thousand tons)	Bituminous Coal Coke <sup>a</sup> (thousand tons)	Iron Ore (thousand tons)	Steel Bars (thousand tons)	Steel Shapes Rails and Accessories (thousand tons)	Rolled Steel Sheet (thousand tons)	Phosphate P <sub>2</sub> O <sub>5</sub> (thousand tons)	Cut Wood (thousand cubic meters)	Cotton (thousand tons)	Cellulose Acetate (thousand tons)
1970	9,233	0	3,471	1,520	1,510	336	369	572	449	1,439	97.3	42.9
1971	9,754	0	4,252	1,321	1,540	383	361	531	448	1,386	83.8	45.4
1972	11,213	0	4,272	1,082	1,558	391	478	457	453	1,405	82.0	31.5
1973	13,025	NA	4,801	1,065	1,531	414	329	497	431	1,308	79.8	32.9
1974	14,134	2,900	4,219	1,020	1,494	457	314	467	239	1,707	90.8	31.1
1975	15,097	3,226	4,411	1,076	1,581	406	333	436	473	1,871	87.6	28.0
1976	16,012	3,369 <sup>b</sup>	4,089	1,085	1,355	397	315	499	477	1,166	68.3	20.1
1977	17,007	NA	4,310	1,088	1,559	388	347	541	430	1,539	156.2	21.5
1978	17,760	3,601 <sup>b</sup>	3,910	960	1,382	352	330	488	363	1,471	73.8	17.2
1979	18,536	4,400 <sup>b</sup>	4,456	903	1,531	285	331	464	451	1,224	66.9	13.8
1980	19,011	6,431	3,376	1,156	1,679	232	322	517	460	1,290	87.2	15.3
1981	19,036	6,265	2,615	1,261	1,866	269	332	512	394	1,440	76.6	10.6
1982	17,709	6,391	2,897	1,055	1,550	250	274	475	416	1,427	90.8	75.3
1983	17,051	6,412	2,958	1,025	1,369	249	227	479	419	1,286	77.9	80.0
1984	17,068	6,167	2,399	1,153	1,215	211	235	473	425	1,366	86.7	85.9

<sup>a</sup> Much of these deliveries originate in Poland but are credited to Soviet account under a complicated trilateral trade arrangement.

<sup>b</sup> Estimated.

Source: *Statistisches Jahrbuch der Deutschen Demokratischen Republik*, various years, Soviet statistics.

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